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Original Communications.

ARE THE FLUID PREPARATIONS OF DIGITALIS ACTIVE WHEN MANUFACTURED INTO TABLETS?

BY E. M. HOUGHTON, M.D.,
Lecturer on Experimental Pharmacology, Detroit College of Medicine.

From the above title it may be inferred that the activity of the tablet preparations of digitalis has been questioned, notwithstanding the fact that pharmacists and manufacturing chemists have prepared such tablets for the medical profession for years. Indeed, this paper was called forth by some clinical experiments which were brought to my attention by the editor of the THERAPEUTIC GAZETTE, tending to show that the tincture of digitalis became inert when exhibited in tablet form, and reported by Dr. Judson Daland to the Philadelphia County Medical Society. I have not been able to find any other reports of experiments on this point, and since the question is one of far-reaching importance, it seemed desirable to make some very careful animal experiments in order to confirm or refute the opinion expressed, and to place the biological results before the medical profession; since by animal experiments we can more exactly study the action of any particular drug upon the various organs than is possible in the human

subject, and the action of the various heart tonics upon the several factors concerned in maintaining the circulation having been very carefully studied in amphibians and mammals.

Material Employed.—(1) New tablets prepared from tincture of digitalis, old stock (No. 3); (2) old tablets (two years old), tincture of digitalis prepared from old stock (No. 3); (3) stock two years old, from which tablets Nos. 1 and 2 were prepared; (4) new tablets containing old fluid extract of digitalis; (5) stock two years old, from which tablets No. 4 were prepared; (6) new tablets prepared from a fresh fluid extract of digitalis; (7) new stock from which tablets No. 6 were prepared; (8) blank unmedicated tablets.

Three series of experiments were undertaken in order to decide the question beyond doubt.

The several tablets, and the preparation from which they were manufactured, were each made into a solution, which represented one per cent. of the crude drug. These solutions were numbered one to eight, to correspond to the tablets and other preparations from which they were made. The tablets were brought into solution by first dissolving them as far as possible in a certain amount of ninety-four-per-cent. alcohol, filtering and washing the undissolved portion on the filter with more alcohol, until there remained little possibility of any of the active constituents of the digitalis remaining undissolved. The filtrate and rinsings were then evaporated at about 70° C. to a pilular extract, which was taken up with the requisite amount of as dilute alcohol as would bring the extract into solution. The preparations from which the tablets were made (since they were alcoholic) were evaporated to soft extract, and then taken up with the same strength alcohol as that employed for dissolving the residues left from the tablets.

I. The minimum fatal dose of each of the several fluids was then determined for frogs of the same kind and weight, kept under identical conditions, with the following results:

No. 1.—Min. fatal dose per gm. body weight, .0009–.
No. 2.—Min. fatal dose per gm. body weight, .0009.
No. 3.—Min. fatal dose per gm. body weight, .0009+.
No. 4.—Min. fatal dose per gm. body weight, .0009.
No. 5.—Min. fatal dose per gm. body weight, .0009.
No. 6.—Min. fatal dose per gm. body weight, .0006.
No. 7.—Min. fatal dose per gm. body weight, .0006.
No. 8.—Several times the amount of this solution, prepared from the blank tablets, as was found necessary to kill with the solutions containing digitalis, failed to produce any ill effect whatever.

In determining the minimum fatal dose, tests were made in each instance upon a number of frogs.

Fluid extract No. 7, from which tablets No. 6 were prepared, was about one month old and from a drug just imported from Germany. It will be noticed that solutions Nos. 6 and 7 were about one and one-half times as strong as the others. However, both the old and the new preparations were much stronger than the average sample.

Very frequently I have found variations of three and four hundred per cent. in the physiologic actions of fluid extracts of digitalis prepared from different samples of crude drug.

While there was a slight variation in the killing power of each of the several solutions, as indicated by the positive and negative signs, no great disparity of strength could be noted between the solutions prepared from the tablets and those prepared from the mother preparations. A careful post-mortem examination of the frogs employed in the experiments was made to determine the condition of the heart. In each instance the organ had ceased beating in the systolic condition; this is practically always the case with the frog's heart when digitalis or other of the heart tonics has been given. It may be gathered also, from the physiological effects of the different solutions, that the active properties of digitalis are not lost more rapidly when the drug is kept in tablets than when it is kept in liquid condition, since tablets No. 1 were equally as strong as No. 2 or preparation No. 3.

II. The action of the several solutions was determined upon the laid-bare frog's heart, the beats being counted at short intervals. Except when the solutions from the blank tablets (No. 8) were employed, the rhythm became slower and slower, and the diastole of the ventricle less and less, while the systole, as shown by the whiteness of the ventricle, became more and more perfect, the heart ceasing to beat in the contracted condition in from ten to fifteen minutes.

No. 1. Normal tracing.
No. 2. One minute after the application of the digitalis solution.
No. 3. Seven minutes after the application of the digitalis solution.
No 4. Twelve minutes after the application of the digitalis solution.

A number of tracings were recorded on the kymograph from the laid-bare frog's hearts, one of which is reproduced herewith, showing the results of an average experiment.

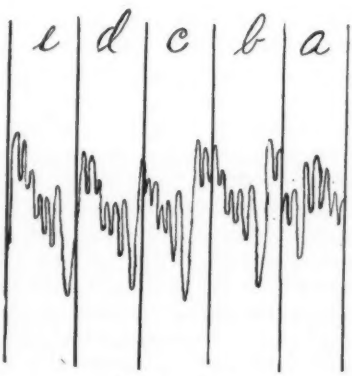
A comparison of the records 1 to 4 on the tracing shows the following points:

1. The rapidity of the beats became less and less, until the heart finally ceased to beat in twelve minutes.

2. The down strokes in the tracing, which were made as the heart assumed the diastolic condition, became shorter and shorter, until finally they ceased to be made.

3. The systolic pause, as shown by the upper horizontal strokes, became greater and greater until the heart ceased to beat, the systolic standstill being marked by a continuous horizontal line about the same distance from the base line as the top of the up strokes in No. 1.

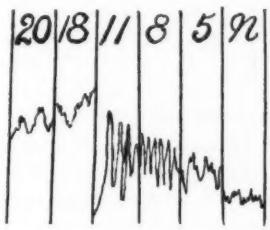
III. Blood-pressure tracings were made from dogs, under the influence of the several solutions, Nos. 1 to 8. In every instance the results obtained showed the characteristic action of the heart tonics except in the case of solution No. 8, which did not influence blood-pressure or the character of the tracing. It is not possible to show all the tracings taken, but the following will indicate very clearly the results obtained. Each of the tracings was taken from the carotid artery, the solutions being injected into the jugular vein. The tracings are all to be read from right to left.



TRACING NO. 1.

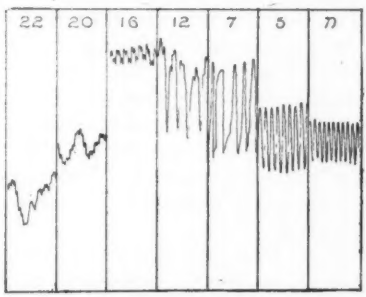
No. 1 shows the action of the solution from blank tablets No. 8: (*a*) The normal tracing before the solution was injected; (*b*) five minutes after the injection; *c*, *d* and *e* were each taken at later periods up to one-half hour. Very large quantities of the solution were injected, still no action was manifested upon the rate or strength of the beats or upon the blood-pressure.

Tracing No. 2 shows the action of the solution from tablets No. 1; while tracing No. 3 is the record of the action of the old preparation No. 3 from which the tablets No. 1 were made. These two tracings show that approximately the same results were produced by the action of the solutions upon the circulatory factors concerned. In each there is a primary slowing of the rhythm without



TRACING NO. 2.

much rise in pressure from the action of the drug upon the medullary centers, and the cardiac terminations of the vagus; at the same time the relaxation and contraction of the ventricle is more perfect. Especially is this noticeable in tracing No. 3, five minutes



TRACING NO. 3.

after the introduction of the drug. In a short time, as the drug is pushed, great slowing of the rhythm is produced, and at the same time the blood pressure rises. Both these results show very clearly in No. 3, while in No. 2 there is marked slowing, but less rise in blood-pressure. As the toxic effects become more pronounced the pressure goes still higher and the beats become more rapid, very irregular, and less perfect. Soon the blood-pressure falls and the heart ceases to beat. Post-mortem examination found the heart in the diastolic condition.

The following table gives the numerical results obtained from an analysis of one of the tracings from solution No. 6:

Time.		Beats in 20 seconds.	Low blood-pressure.	High blood-pressure.	Mean blood-pressure.	Remarks.
Min.	Sec.		Mm.	Mm.	Mm.	
0		25	60	120	90	Normal.
1	12	25	52	122	87	Normal.
2	50	24	60	136	98	1 Cc. solution in the jug. vein.
4	7	25	58	130	94	
5	50	21	70	144	107	
7	..	20	72	150	111	2 Cc. solution in the jug. vein.
8	30	17	82	160	121	
11	..	17	98	178	133	
11	30	..	..	...	...	3 Cc. solution in the jug. vein.
15	..	60	168	194	181	
19	..	..	...	...	...	2 Cc. solution in the jug. vein.
23	40	61	90	130	110	
27	..	..	...	...	...	Dead

Blood-pressure is given in Mm. of mercury.

A point worthy of serious consideration is the variability in the quantity of active constituents in different samples of crude digitalis as shown by physiologic examination. The lack of action manifested by the tablets prepared for Dr. Daland may have been entirely due to an inactive drug having been employed for making into the tincture. The pharmacist may easily be deceived as to the active qualities of the crude drug digitalis, procured on the market for his preparations, as he cannot rely upon the physical appearances as being the correct criterion of strength, and he has no way of making a chemical assay. The only way he can guarantee that his preparations of the heart tonics are physiologically active is by an actual test on animals, or by a clinical experiment. The latter method, of course, should never be employed, as the reaction of animals to the heart tonics is positive.

I believe we are fully justified in drawing the following general conclusion from the above series of experiments: Active fluid preparations of digitalis do not lose in activity by being manufactured into tablets, nor do the tablets become less active by keeping than do the other preparations of digitalis.

THE ENURESIS OF CHILDHOOD — THE RATIONALE OF TREATMENT.

By Raymond Crawfurd, M.A., M.D. Oxon., M.R.C.P. Lond.,

Assistant Physician to the Royal Free Hospital, and to the Victoria Hospital for Children, Chelsea.

The experience of a large out-patient department of a children's hospital suggests to me that no apology is necessary for the attempt, however trivial, to introduce order into the therapeutic chaos that hangs about this subject. Medical men seem to have two weapons with which to urge an ineffectual crusade—belladonna and circumcision—and lean to one or the other indifferently, as their tendency is medical or chirurgical. Each may be an excellent remedy in appropriate cases, but let us pour our libations of belladonna on the altar of Reason, and not on that of Authority, and let us not make a scapegoat of any but an offending foreskin. To this end it is essential to have in mind the exact mechanism of micturition, and the possible derangements that may conduce to enuresis. In infancy enuresis is a normal condition because of the functional immaturity of the centers of inhibition, reflex micturition being not yet resisted by the will. It is as though in infancy the connections of the spinal with the cerebral centers were cut, for will at this period is a negative quantity. The exact condition will be readily seen on reference to Fig. 1, which shows diagrammatically the machinery of micturition in early infancy.

Micturition is, then, practically a simple reflex, as the brain knows nothing of what is taking place in the bladder. At a certain degree of distention the nerve terminals of the bladder convey an impulse to the sensory portion (S) of the spinal center, which communicates it to the detrusor center (D) and the sphincter center (Sph.), so that there is simultaneous contraction of the detrusor urinæ, and relaxation of the sphincter vesicæ, and urine escapes under pressure from the bladder (B). As soon as a few drops of urine have entered the proximal portion of the urethra (C), which is intensely sensitive to its presence, still stronger impulses are conveyed to the sensory spinal center and energetically maintain its activity.

In the very large majority of cases of enuresis we have to deal not with a persistence of this condition, but with a retrograde tendency setting in after full control has been established. In some cases, however, either from improper training by the nurse or from defective educability of the child, it is a mere continuance of the infantile condition, and the requisite treatment is more careful instruction. But in most cases the center of inhibition is developed, and has exercised functional activity, but for some cause or other has lost its supreme control. There is in fact a falling back from the condition shown in Fig. 2 to that of Fig. 1.

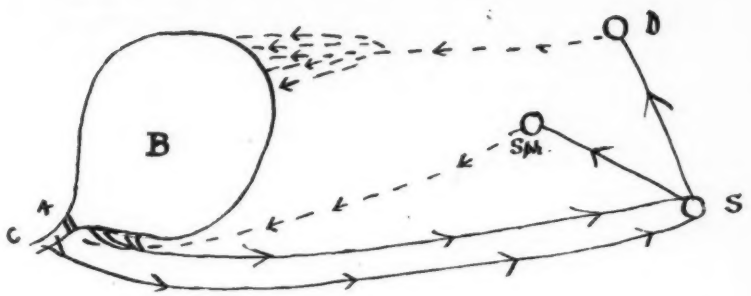


FIG. 1.

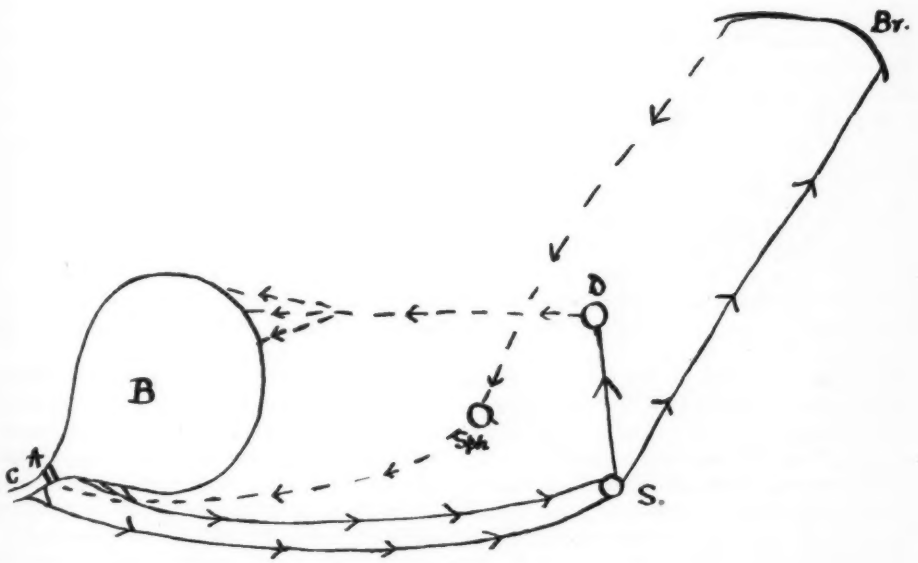


FIG. 2.

In Fig. 2 the mechanism of full control is shown. The message received at S is communicated to the brain (Br.) and to the detrusor center; the brain in turn relaxes the sphincter, and micturition takes place. The practical question then that arises in cases of enuresis is, how is this retrograde tendency brought about? and on this hinges the whole question of treatment. If the sphincter vesicæ is under complete control of the will, how is it that the balance of power passes over to the side of the detrusor? During sleep the inhibitory influence of the will is very largely in abeyance, so that there is a partial interruption of the connections of the spinal center with the brain center; hence, while diurnal enuresis is comparatively rare, nocturnal enuresis is extremely common. Sleep, then, tends to reopen the reflex arc, and the heavier the sleep the greater the tendency. Again, it is possible that in sleep the brain center may be disturbed by psychical influences, but I cannot say that I am convinced of such a psychopathic form of enuresis. Such psychic disturbances originating in the brain may conceivably be transmitted as impulses to the spinal centers and induce micturition. The child may dream that he is in a convenient spot to ease himself, and take advantage of it. Certainly some children are intensely sensitive to the uncleanliness of the habit, and it is possible that they may thus be subject to some kind of autosuggestion. That such a *reve urinaire* does exist is beyond doubt, but whether it be the cause or the consequence of enuresis is very difficult to decide. Diagrammatically this form of enuresis is shown in Fig. 3. Here the impulse starts from the brain and travels to the sphincter center, relaxing the sphincter, so that a few drops of urine enter the urethra; a message is at once

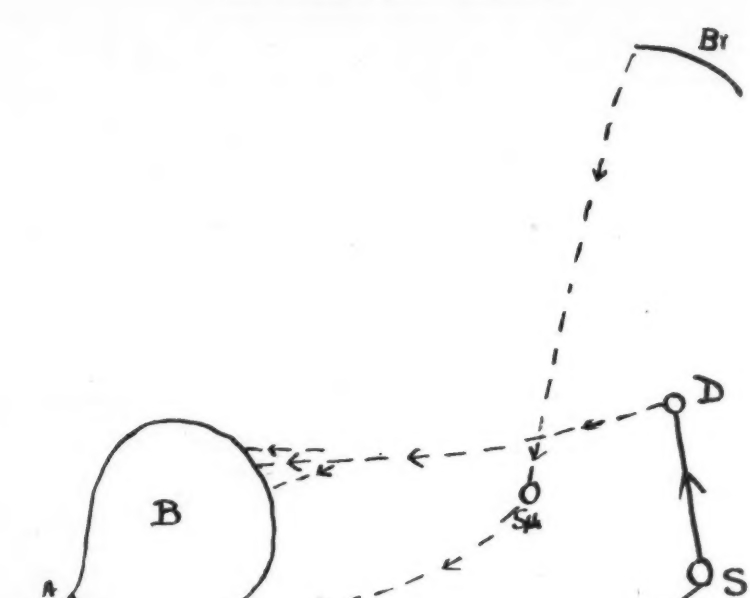


FIG. 3.

sent to the sensory center, which in turn stimulates the detrusor center, and micturition ensues. The brain need receive no message from the sensory center.

I have never been called upon to treat a case of psychopathic enuresis, and may I never be, if corporal punishment be as suggested the appropriate remedy. I can conceive no means better calculated to rivet the child's thoughts on his urinary apparatus, so as to intensify the mental inclination to a maximum. For such cases suggestion would at least supply a rational procedure. Liébeaut met with some amount of success by this method. He aimed at securing some degree of hypnosis, and then suggested to the child to get up at fixed hours to pass water, gradually prolonging the interval, until control was reestablished.

But over and above the influence of sleep, we have in enuresis to deal with instability or disturbance of some part of the nervous mechanism of micturition. In some cases we find an exalted excitability of the nervous centers so that the response to ordinary excitants is excessive, while in others with a normal nervous system we find irritable or irritated peripheral nerves that stimulate the center too strongly or too often. Thus the nervous system may be hit at the center, in the cord or in the brain, or at the periphery, in the bladder or its neighborhood. Trousseau regarded enuresis as essentially a neurosis, and it must have struck every one that the sufferers are not of the dull, lethargic order of beings, but are for the most part mentally precocious children, whose nervous mechanism is ever ready to run riot. As might be expected, there is a close relationship of enuresis to the other neuroses of childhood, such as somnambulism, night terrors, and the multiple nervous manifestations of rickets and adenoids. Sometimes this nervous irritability is the remainder of some acute illness, or some prolonged drain on the health and strength of the child. In all these cases anemia is seldom absent, and one can readily understand how such a cause may increase the reflex excitability of the lower centers, so that they respond to minimal stimuli, or may lessen the functional activity of the higher cerebral centers, so as to diminish their inhibitory influence over the spinal centers. The anemia of childhood, though usually referable to bad hygienic conditions and improper feeding, is not infrequently traced to rickets, tuberculosis, rheumatism, and syphilis, and with such an association we may have an important lead in therapeutics. I have been particularly struck with the

frequency of rheumatism in the child or its parents, and its influence seems to me to be due rather to the rapid and intense anemia it produces than to any alteration in the acidity of the urine.

For one or other of these causes the sensory center in the cord is hypersensitive, and stimulates the detrusor center too strongly, while maybe the brain exerts too little energy in maintaining the tone of the vesical sphincter; and if by chance the vesical sphincter be organically feeble, there will be still less opposition to the expulsive force of the detrusor muscle. Thus in front of the nervous background with which we have to deal, there stand two main physical faults: on the one hand there may be excessive irritability of the muscular coat of the bladder, on the other deficient resisting power of the sphincter, or both may be conjoined. The most approved combinations of drugs, the most fashionable alkaloids, can hardly transform a temperament in a few weeks. A spell of running wild in fresh country air, a respite from lessons, a more liberal allowance of sleep, may succeed where medicine has failed to invigorate the nervous system. Where anemia is manifest one may often succeed with some light preparation of iron along with nux vomica, with or without adjuvant remedies, as the indications of the individual case suggest. If a rheumatic tendency is established it is well to give salicylates a trial, but not to the exclusion of iron. Now and again I have felt half-ashamed of myself for curing a case by having a crop of adenoids removed, and others unblushingly acknowledge the same success. I am quite clear that tea given to children at the evening meal is sometimes at the root of the disorder, and more than once I have been rewarded by forbidding it; and one cannot be too careful of the state of the digestive system, for like convulsions, enuresis may often be traced to some digestive derangement.

When there is reason to suspect abnormal excitability of the muscular coat of the bladder, belladonna should be given. Belladonna is useless as a specific, invaluable as an adjuvant remedy. It is futile to stake one's expectations on belladonna, when anemia is manifestly the prime cause of the derangement, while a combination of iron and belladonna will in all probability effect a permanent cure. The dose should be pushed to its physiological limits—that is to say, till dryness of the throat, dilatation of the pupil, or even the specific eruption afford a danger signal. I am in the habit of commencing with ten to fifteen drops of the tincture three times a day for a child of four to five years, and increasing weekly by five drops to each dose till there is some sign either of abatement of the disorder or of physiological reaction. It is of the utmost importance not to abruptly relinquish the drug as soon as the habit is broken, or recurrence will almost certainly lead to disappointment. It is best to maintain for a week or so the full dose, and then gradually diminish the dose over a period of weeks.

Great irritability of the muscle coat is usually evidenced by an imperative call to micturition during the day, as well as by nocturnal enuresis. When the sphincter alone is feeble, there is no imperative desire, but utter inability to check the outflow at intervals even during the day. When weakness of the sphincter of the bladder is superadded to irritability of the muscular coat, no combination is so beneficial as that of belladonna and nux vomica; often it acts like magic. Other drugs, such as ergot and rhus aromatica, are extolled as substitutes for strychnine, but I have carefully tried both and found them inferior. In severely atonic cases ergot and strychnine may be given in combination. Rhus aromatica is most suitably prescribed in the form of the fluid extract with a little mucilage and water; given alone I have found it comparatively ineffectual, but combined with belladonna an excellent combination in some cases in which nux vomica has seemed undesirable. The use of the interrupted current has been advocated as a rational measure in these cases of atony of the sphincter, but I can offer no opinion of its usefulness, as I have never employed it myself, nor seen others do so. A disk electrode is placed on the symphysis pubis, attached to the positive pole, and a bougie, insulated except at its extremity, is passed up to the sphincter and attached to the negative pole.

Lastly, the fault may be in the peripheral nerves, that carry too vigorous impulses to the sensory spinal center, so that it acts incontinently in spite of itself. In all cases a careful and minute search should be made for an irritant in the urine, in the bladder, or in its neighborhood, to which it is intimately linked by the nerve plexus of the pudic. Such irritants will of course act at a great mechanical advantage in a neurotic subject, whose central nervous system is disordered.

The greater incidence of the disorder on the male sex seems to me to point to the relatively greater importance of these peripheral irritants, such as one would expect from the length and complexity of the male urethra compared with the female. High acidity of the urine is a well recognized cause, and in specimens that have been brought to me uratic deposits have sometimes been particularly abundant. Then a few drops of liquor potassæ with a little belladonna may be given, till litmus paper shows a neutral reaction of the urine. Nothing could be more prejudicial than cutting down the supply of liquid. Water should be freely given to diminish the concentration of the urine; or milk, one of the best of diuretics.

Other cases seem to depend rather on the increased quantity than on the altered quality of the urine. Thus enuresis is much more common in the winter months than in the summer; sometimes appears to be due to an excessive intake of liquids, and sometimes is a danger signal heralding the presence of diabetes or chronic nephritis. The early hours of the night at which enuresis most often occurs is opposed to its frequent occurrence from overdistention. In these cases it may be well to cut down the amount of liquid taken in the later hours of the day. Such children should be made to pass their water before getting into bed, and again when the parents go to bed, and if possible once again in the course of the night.

In some cases the irritant resides in the bladder itself, maybe in cystitis or calculus, conditions that render its muscle coat unduly sensitive. Such conditions in children are rare, and should be treated on the usual lines. There is also a condition of the bladder which, though more properly an effect than a cause of enuresis, serves to render the habit persistent: this is a contracted state of the bladder, so that it can only hold the smallest amount of urine, and must constantly relieve itself by overflow. In the daytime the child should be encouraged to hold his water as long as possible, so as to exert some distending pressure on the bladder-walls; or it may be necessary to have recourse to forcible distention by the hydrostatic pressure of any antiseptic solution. The treatment is analogous to dilatation of urethral stricture by means of bougies, and as in this latter case should be repeated at intervals so as to prevent recontraction.

Sometimes the external genitals are at fault; one most often finds either a simple phimosis or preputial adhesions. Neither of these conditions in itself will probably cause enuresis, but only by reason of the balanitis that is set up by the retained secretion. Where preputial adhesions exist, these should be broken down, so that the smegma may be removed. Daily retraction and scrupulous cleanliness, aided by the use of a little lubricating oil, will usually prevent their recurrence. Phimosis may often be successfully dealt with by simple dilatation of the orifice, and in exceptional cases by circumcision. And to stay the surgeon's knife, I should like to put it on record that I have met more than one case of enuresis that had dated definitely from circumcision. This I conceive to be due to exposure of the sensitive glans penis.

Occasionally masturbation and enuresis coexist. Is the one the cause of the other, or is it a casual coincidence? No doubt the habit tends to center attention on the genitals, and may give rise to a psychopathic enuresis. Once or twice I have noticed an extreme hypersensitiveness of the deep urethra on passing a catheter, and the fancy has struck me that possibly repeated masturbation may render the urethra hypersensitive. If this be so, we can easily understand how the entry of a few drops of urine into the deep urethra would stir the spinal center into activity, and cause evacuation of the bladder. The sole justification of this theory is the success of treatment based upon it in a few cases. Local sedative treatment is indicated, such as application of cocaine to the hypersensitive part of the urethra, and daily passage of a catheter, so as to accustom the urethra to resist irritation. If bromides have any place in the treatment of enuresis, these would seem to be suitable cases for their exhibition. For my part I look with suspicion on any drug that deepens the slumber of the higher nervous system.

There is an intimate nerve relation of the bladder with its neighborhood, mainly in the ramifications of the pudic nerve. In this way threadworms, rectal polypi, a loaded bowel, fissures and other local derangements, and in the female vulvo-vaginal catarrh, seem to set some cases in motion. There can be no doubt of the malign influence of constipation, but I cannot say that I have found threadworms with greater frequency in the subjects of enuresis than in other children. There is no need to enlarge upon the appropriate treatment of these several conditions.

*THE USE OF PILOCARPINE IN SOME ACUTE INFECTIOUS DISEASES.**

By E. W. Saunders, M.D.,
Professor of Pediatrics, Missouri Medical College;
John Zahorsky, M.D.,
House Physician to the Bethesda Foundling Home;
and
C. Fisch, M.D.,
Assistant Demonstrator of Bacteriology, Missouri Medical College.

In the study of the physiological action of pilocarpine, it is important to note that urinary solids are excreted with the hyperidrosis induced by the drug. That leucomaines, ptomaines, and possibly toxins, may be similarly excreted has been pointed out by several writers. The intense salivation that follows the administration of a full dose is a far more powerful means of eliminating toxic substances. Moreover, the observations of Sabbatani[1] seem to prove that pilocarpine has a diuretic action. Solomon Solis-Cohen[2] has found that this medicament very much increases the diuretic action of sparteine. Clinical observation has convinced us that urinary solids, especially urea, are eliminated in increased quantities under its influence, as was first pointed out by Lauder Brunton. We are compelled to conclude, therefore, that this alkaloid is a potent means of ridding the organism of baneful material. Its value in uremia and dropsy is a long attested clinical fact.

But in enumerating the various sources of elimination, the stomach as an excretory organ should not be forgotten, and the vomiting and diarrhea which frequently ensue after a large dose of pilocarpine are due partly to the irritation produced by the excreted leucomaines and specific toxins.

Great importance, also, must be attached to the powerful cleansing effect on the faucial mucous membrane, which is produced by the outflow of several pints of saliva.

Wallstein,[3] Horbaczewski[4] and Wilkinson[5] have shown that pilocarpine induces a marked leucocytosis. The last writer also describes peculiar changes in the morphological and chemical nature of the oxyphile leucocytes; this, however, is as yet not known to be of any practical importance. But the increased formation of leucocytes suggests that phagocytosis may be promoted, and the production of alexins increased.

Pilocarpine causes enlargement of the spleen, according to Horbaczewski, and this is the more remarkable, since its stimulation of unstriped muscular fiber and the consequent reduction in bulk of other viscera is well known; therefore, this enlargement cannot be attributed to relaxation of the capsule and trabeculæ, but must be referred to vascular fulness, and probably to some accumulation of white blood-corpuscles.

In fevers the effect of pilocarpine on temperature is marked, lowering it from one-half to three degrees, this fall ensuing within half an hour after profuse salivation. Reichert[6] holds that this descent in temperature is due more to the lessened production than increased dissipation of heat. No doubt the rapid elimination of the pyrogenic toxins is the chief factor to be taken into account.

We must be careful to distinguish between the primary and the secondary physiological effects of pilocarpine. The former are increased rapidity of the pulse and dilatation of the peripheral capillaries with a resulting diminished blood-pressure. The secondary effects are the diaphoretic and sialagogue influence. We endeavor to obtain these secondary symptoms in all cases. We have administered pilocarpine thousands of times, always with due caution, and have never noticed any depression that might be termed dangerous to life, although the family and attendants of the patient are often seized with panic.

Though the germ theory of disease revolutionized our ideas of pathology, and marked a tremendous advance in medical science, still we have as yet been unable, except in a few instances, to find potent germicides which shall act specifically without toxicity to the organism. The scientist, therefore, has turned to the study of the processes whereby the body overcomes infection, hoping to discover measures whereby cellular resistance may be increased. Already the discovery of antitoxins, alexins, globulicides and agglutinins opens a broad path for the advance of the thinking mind; and the hope is cherished that the production of perfect immunity to all infectious diseases may be the ultimate result of scientific research.

At present our means have not been sufficiently perfected to produce this ideal state. We must therefore resort, in the treatment of most diseases, to means which, while not curing the disease, still modify its course and minimize the danger to the integrity of the tissues and the functions.

* Read before the Bethesda Pediatric Society of St. Louis, Dec. 10, 1897.

It is still open to grave doubt whether a fully developed infectious disease can be aborted by therapeutic measures other than antitoxins, and therefore in the treatment of any infection it is folly to use powerful antiseptics, which cannot possibly destroy the whole infection, and may be very injurious to the tissue cells; much wiser is it to allow the disease to take its natural course. The symptomatology of most infectious diseases is the physiological action of the specific toxins generated by the actively growing pathogenic bacteria. Under the stimulus of the toxins the antitoxins are gradually formed, and thus a stage is reached where the latter overcome the former. In most diseases the symptom-complex is the result of many poisons, frequently due to a variety of microorganisms, and even to autointoxication, so that artificial antitoxins would necessarily have to be very complex in constitution to meet all possible exigencies, and their preparation for most diseases oversteps the limits of our present chemical and physiological knowledge.

We are compelled, for a time at least, to allow the cure of the infection by the natural processes, but in all cases the indication is to prevent the accumulation of toxins to such an extent as to act deleteriously on the various organs—even destroying the cellular elements—instead of acting as a stimulant to the formation of antagonistic principles.

Pilocarpine is the most effective agent to stimulate the excretion of noxious substances, without at the same time adding to the general toxemia. In the early stages of most acute infectious diseases a marked insufficiency of renal activity occurs, as shown by analysis of the urine, so that a retention toxicosis increases the complexity of the symptoms. In this stage the value of sudorific baths is well known, but more powerful still is the action of this alkaloid in removing poisonous substances, which the paralyzed renal cells refuse to excrete. Pilocarpine is particularly indicated in those infectious diseases in which the fauces are the seat of bacterial growth. The swollen mucous membrane is depleted, pseudo-membranes loosened and washed off, and the bacteria carried away in the flood. The direct cellular resistance to the action of the bacteria is also enhanced by this drug, and it is to be remembered that the increased formation of leucocytes may aid in bacterial destruction by phagocytosis and by alexin production.

Since Brieger has found tetanin in the saliva, we may well conclude that the time-honored custom of treating acute infectious diseases by inducing salivation was in some respects at least a salutary one, for by the salivary glands, whose secretion is normally albuminous, can the toxalbumins be most readily eliminated. As a matter of fact we know that the urine does not show the presence of toxalbumins, unless the renal function has become damaged to such an extent that the urine is albuminous.

Perhaps an equally important effect of pilocarpine in acute infectious diseases is to be found in its presumed action upon the cells of the liver—for it stimulates more or less every gland cell in the body. The increase of urea points indubitably to an increase of function in the liver cells in one direction, and we may safely believe that its toxilytic function, of which we know with certainty in respect of the alkaloids, is tremendously increased by the administration of pilocarpine. It is credible also that the lymphatic glands may be favorably influenced in their defensive work by the action of this drug.

Administration.—The alkaloid should in all cases be used; for the infusion and fluid extract of jaborandi contain besides pilocarpine the alkaloid jaborine, which is antagonistic to the action of the former base, resembling atropine in its action; consequently a very large dose of the crude drug must be given to produce diaphoresis and salivation. It is to the use of the whole drug that many of the cases showing toxic symptoms must be ascribed.

Pilocarpine is prescribed in the form of one of its salts, as the hydrochloride or nitrate. The dose ranges from one-eighth to one-fourth grain. The smaller dose should first be used, and the drug must be pushed until its characteristic effects are produced. It is worse than useless to give doses insufficient to produce the secondary symptoms. Tolerance is soon established, and in certain persons we must gradually increase the dose to the maximum. The physiological action commences within fifteen minutes and lasts from one to three hours. Children and infants need proportionately larger doses; the dose as calculated by Cowling's rule must frequently be doubled. Under one year the weight of the infant is taken for the proportionate dose. In general an infant trebles its weight by the end of the first year; consequently an infant at birth receives one-third and at six months two-thirds of the

dose given to a baby of one year. When speedy action is desired, or the stomach is irritable, the subcutaneous injection is to be preferred; but in most cases it can be given by the mouth. In nearly all infectious diseases the administration should be continued for one or two days only, or until the toxilytic and eliminative organs are thoroughly capable of performing their function unaided. In erysipelas, however, its continued use for several days is necessary.

We find most physicians hesitate to use pilocarpine, giving as a reason that they fear depression of the heart's action and collapse. Personally, we can say that we have never had occasion to regret its use; however, an insufficient dose of the pure alkaloid may accelerate the pulse and produce flushing of the skin, without any amelioration of the symptoms whatever. Then, again, the drug jaborandi may bring about a condition closely simulating atropine poisoning. As a result of excessive depletion—for pilocarpine stimulates more or less every secreting cell in the body—we may have symptoms of collapse; but its action can be instantaneously arrested by a hypodermic injection of atropine, and the system rehabilitated by strychnine.

The contraindications to its use are offered by all diseases producing death by suffocation, and conditions of the heart in which sudden failure might be apprehended—a thing rarely to be feared in childhood in the first stage of an acute infection. Any apprehension of pulmonary edema would form a contraindication. The slightest approach to coma—as in the eclampsia of childhood and of the puerperal state—offers a strong bar to its use. In diphtheria it should not be used after the advent of paralytic symptoms, which may be expected on the sixth day at the earliest. In some patients vomiting is a very distressing effect of the drug. In every case its physiological action is opposed to the digestion and absorption of food, and its administration therefore must be uninterrupted if it has to be prolonged.

Diphtheria.—In a previous paper, published in the *Virginia Medical Monthly*, one of us has urged the employment of pilocarpine as an adjuvant to the use of antitoxin in diphtheria. Further experience has only strengthened the position taken then. Complications due to the streptococcus need not be feared when this alkaloid is used. A recent pseudomembrane is soon washed off by the flow of saliva, and the tonsils and fauces appear smooth and healthy. Local treatment is thus dispensed with. Moreover, the free salivation prevents the overaccumulation of the diphtheria toxalbumin, while the organism is becoming immunized by the antitoxin administered. The objection has been raised that the antitoxin may be similarly excreted with the toxin, and consequently a less perfect immunization would result; but this theoretical objection is silenced by the laboratory experiments cited in this paper.

An important effect is the excretion by the skin and salivary glands of normal excrementitious substances, thus relieving the renal insufficiency. The sudden advent of convalescence, due to the action of antitoxin, throws a tremendous amount of catabolic products on the emunctories, and the weakened kidneys may not successfully remove them; so here again salivation, diaphoresis and gastro-enteric elimination are salutary. Paralysis and nephritis are very rare sequelæ, when antitoxin is synergized by pilocarpine and administered early in the disease.

In laryngeal diphtheria its use is fraught with danger, unless the case be closely watched. However, our friend Dr. Auler has had phenomenal success in just such cases under the free use of pilocarpine, and Sziklai very strongly advocates its use in croup. In severe cases of diphtheria we may have four intoxications to fight, against only one of which does the antitoxin avail us, to wit: (1) that resulting from the Klebs-Loeffler bacillus; (2) that resulting from the pyogenic organism; (3) that resulting from the putrefaction of the psuedo-membrane (perhaps also from necrosis of the underlying tissues); (4) autointoxication.

The objection that might be urged against the use of antitoxin alone is that it acts so slowly, allowing the toxemia unhindered sway for many hours, and then meeting the enemy in one form only. In pilocarpine we find a remedy which admirably supplements the peerless antitoxin. Against a coccus invasion of the throat it is specific, whether in diphtheria, scarlet fever, or influenza.

Of the reality of putrefactive alkaloidal intoxication we are satisfied, not only by the horrible stench, but by the totally changed aspect of the case. The initial high temperature falls on the second or third day to 100° or thereabouts, whilst the pulse becomes more rapid, perhaps slower, but always more feeble. The countenance assumes a peculiar mottled, pallid hue, whilst the patient sinks into a profoundly apathetic condition. It

used to be said that this was due to the pressure of the swollen glands upon the cervical vessels, but of this there was never any proof. Convulsions never occur in these cases, for the paralyzing, stupefying ptomaines hold sway until death. Pilocarpine changes this whole scene within a few hours by eliminating the alkaloids, and perhaps stimulating toxilysis in the liver.

Again, at an earlier stage we are warned of the existence of an overwhelming autointoxication—a retention toxicosis—by the behavior of the kidneys. At the very outset, with a high temperature and active delirium, perhaps convulsions, the urine is almost colorless, and of very low specific gravity. The leucomaines as well as other waste products are, we know, being elaborated in greatly increased amounts, and yet the kidneys refuse to excrete them. Pilocarpine changes this in short order, as shown by the speedy amelioration of the symptoms, and the change in the urine to a dark color and to a higher specific gravity.

Lastly, pilocarpine assists antitoxin in its own proper warfare against the toxalbumin of the diphtheria bacillus, as shown by the fact that we get much more speedy returns from our antitoxin, and by the further fact that we seldom or never are called upon to repeat the injection. Of its signal and marvelous efficacy in this particular the evidence is given by the laboratory experiments we shall cite.

It has been proven that the tetanus toxin is excreted by the salivary glands, and Yarrow has saved animals into which he had injected a fourfold lethal dose of rattlesnake venom, by the use of jaborandi. One of us has made experiments in the laboratory on guinea-pigs, the report of which is added here. This gives unanswerable proof of the value of pilocarpine in diphtheria.

It is well known that in an animal that has received a lethal dose of diphtheria toxin, counteracted by a simultaneous dose of antitoxin, a very slight surplus of toxin proves fatal; in other words, death occurs under these circumstances from a quantity of toxin, which alone would hardly have elicited any reaction whatsoever. As an instance, if 0.1 cubic centimeter of toxin (being the fatal dose) is antagonized in a 250-gramme guinea-pig by 0.1 cubic centimeter of a 1:1000 dilution of antitoxic serum (of 100 units to the cubic centimeter), the addition of 0.02 cubic centimeter of toxin to this dose of 0.1 cubic centimeter is sufficient to kill the animal within twenty-four to forty-eight hours.

In this experiment 0.02 cubic centimeter of toxin killed the animal, while administered alone the dose would not harm it in any way. This interesting fact was utilized for deciding what effect pilocarpine had in saving the animals from the lethal effect of a surplus of toxin over antitoxin.

Two guinea-pigs, in the first experiment, were injected with 0.12 cubic centimeter of normal toxin, which was mixed with 0.1 cubic centimeter of a 1:1000 dilution of antitoxic serum of 100 units strength (really the serum contained only 95 units to the cubic centimeter). At the same time one of the two received an injection hypodermically of one-thirtieth grain of pilocarpine hydrochlorate. Both animals were kept under absolutely the same conditions. The pilocarpine guinea-pig remained healthy and did not even show infiltration at the site of injection, while the other animal died in thirty-six hours. The post-mortem revealed the typical lesions of diphtheria poisoning.

In another experiment two animals were treated in the same way, only the pilocarpine injection was made twelve hours after the toxin-antitoxin injection. The result was practically the same, except that in this experiment the death of the first animal occurred after forty-eight hours. No infiltration was found in the pilocarpine animal.

There was no time to follow up these investigations any further; the urine ought to be examined, temperatures taken, etc. It seems to us, however, that it is not unreasonable to conclude that the administration of pilocarpine effected the excretion of the surplus toxin in time to save the organism from its assaults—that means to prevent it from acting on the nerve centers.

Since these experiments have been made we have adopted the custom of administering small doses of pilocarpine to goats and cows, which are being immunized against diphtheria, and the mortality of which formerly was quite large. Only the most beneficial results can be reported from this custom, no death having occurred since that time. Furthermore, the increase in antitoxic potency of the serum and milk of these animals is in no way impaired by this practise.

Where in the whole range of experimental medicine (outside of the antitoxins) can the life-saving efficacy of any drug be proved with such mathematical precision?

The literature on the subject of pilocarpine in diphtheria is becoming quite extensive. Originally suggested by Senne,[9] it was strongly advocated by Guttman[10] and Lax.[11] An enthusiastic supporter is Sziklai,[12] who uses it in all inflammations where an exudate is present. Barsky[13] also reports favorably upon it. We find Benesch,[14] Herschfeld,[15] Ketchum,[16] Faludi[17] and others recommending it. Archambault[18] and Laschkewitz[19] several years ago condemned its use, before antitoxin was used.

Diphtheroidal Angina. — In all inflammations of the pharynx and fauces accompanied by an exudate pilocarpine is a sovereign remedy. In follicular tonsillitis it is much more effective than benzoate of soda or the salicylates. The depletion, with the thorough washing, suffice to cure the disease inside of two or three days. The fever also rapidly falls and the general symptoms soon ameliorate.

Scarlatina. — The experiments in scarlet fever with antistreptococcic serum have not been encouraging, and until a more perfect immunizing agent is found, remedies which meet the general indication of toxemia will necessarily be resorted to. Such a remedy we have in pilocarpine, and we therefore urge its employment in this dreadful exanthema. We believe, with others, that the uncomplicated scarlet fever is exceedingly ephemeral, and the continuance of fever and the production of sequelæ are due to the associated infections by pyogenic micro-organisms.

The dangers of this disease may be classified into those symptoms, complications and sequelæ due to a complex toxemia, and second, those due to faucial and pharyngeal inflammation. In the former class belong the severe nervous and cardiac symptoms, the nephritis, and the inflammation of the serous membranes. By the early and constant elimination of the toxins these dangers may be successfully obviated. The kidney which is so susceptible to the scarlatinal poison refuses at the outset to excrete the toxins, and more than that, is inadequate to rid the body of the normal urinary constituents. And here we wish to protest on theoretical as well as practical grounds against the administration of potassium salts in renal inadequacy, for we know that the potash salts are the most important contributors to uro-toxicity, and their ingestion while stimulating the kidney for a short time must necessarily increase the toxicity of the blood. It is much better to eliminate the toxins as well as some of the normal urinary constituents by other channels, until the kidneys resume a stronger activity.

Marked as is the effect on the general symptoms, the favorable influence on the faucial inflammation eclipses it. The swollen mucous membrane is very much depleted, diphtheroidal exudate is loosened, and the intense suffering is relieved. Streptococci are washed off from the mucous surfaces and the toxins in the blood are thrown off by the salivary glands. The cervical lymphatic nodes, therefore, receive less poison and their subsequent inflammation and suppuration is prevented. If these nodes are found infected, the depletion of the mucous membranes and removal of the poisons put them in the best way of recovery. We have not encountered any cervical abscesses since we commenced the use of this remedy.

Another very serious sequel, the occurrence of which this treatment prevents, is suppurative otitis. The pharyngeal inflammation extends along the Eustachian tube, causing stenosis, and the accumulation of purulent exudate in the tympanum. But under the influence of pilocarpine the mouth of the tube remains patulous, as the swelling of its lining membrane is diminished, and drainage is not interfered with. We have not had a single case of otitis media suppurativa in the many cases of scarlet fever that we have had under our care in the last three years.

About twenty years ago one of us used pilocarpine in scarlatina without success, owing to timidity in pushing the drug to its physiological effect. It is well to emphasize that the higher the temperature the more pronounced the onset of the infection and the larger the dose that must be given. In these severe cases the pulse becomes much stronger under the influence of a full dose.

We claim, therefore, that pilocarpine meets the requirements of the disease better than any known drug, and in urging its extended use we feel confident that the mortality and sequelæ will be greatly reduced.

Influenza.—The bacillus of Pfeifer is universally recognized as the prime factor in the etiology of influenza, but as in scarlet fever, the anatomical lesions depend on secondary infections. The streptococcus is commonly present in the various lesions. Considerable doubt exists as to the site of the primary bacillary growth in all cases, but in our experience the fauces in the vast majority of cases is the infected area. A rhinitis is also a common concomitant lesion.

The angina is especially to be noted, since it presents characteristics which are diagnostic. On inspection we find the posterior and lateral wall of the oro-pharynx, also the pillars of the fauces, tonsils, uvula, and the free border of the soft palate, exhibiting a cardinal red, swollen, succulent and velvety appearance. The inflamed area, on the soft palate especially, shows a distinct line of demarcation from the healthy mucous membrane. The inflammation is bilateral and perfectly symmetrical.

The diagnostic features are the symmetry, the distinct line of demarcation, and in the severer cases the peculiar velvety, succulent appearance.

It is in this variety of grippe that pilocarpine is often efficacious. The headache, rachialgia and pain in the limbs are speedily relieved, the fever is reduced, and the attack frequently aborted; its whole action being similar to that in other anginas.

Pneumonia.—The use of pilocarpine in pneumonia has been enthusiastically advocated by Sziklai;[21] in fact, this author urges its use in all inflammations accompanied by any fibrinous exudate. He claims for it, first, a mechanical action, the increased secretion carrying off the exudate; and second, a chemical action, by which is meant the destruction or dissolution of fibrin.

On theoretical grounds it is difficult to understand how pilocarpine can increase the secretion in the air-vesicles, since these are not supplied with glands. The only possibility to be considered is the increase of bronchial secretion and this flowing backwards into the vesicles. This must certainly increase dyspnea and perhaps aggravate the symptoms enormously. But, happily, it is only rarely that the bronchial mucus can be increased to such an extent as to fill the unaffected vesicles.

Resorting to chemical activity to explain the removal of fibrin can be objected to on the grounds that we have no proof of such action in other regions.

We believe on practical grounds that Sziklai has gone too far in his enthusiasm to laud the action of this drug. Yet we must admit that he has found an earnest disciple in Poulet,[22] who reports 104 cases of pneumonia due to influenza treated by pilocarpine with only four deaths. He gives about five-sixths of a grain at a dose, giving one dose each day for two successive days in the early stage of the disease.

Ernest Glass,[23] however, as a result of a careful analysis of eighteen cases treated by pilocarpine, does not find any benefit, even claiming an extension of the inflammatory process under its use. He believes these results do not justify further trial.

We have tried pilocarpine in a few cases of pneumonia. When the disease is well advanced it certainly is a dangerous remedy. Yet we are convinced that we have aborted a frank pneumonia by a few full doses given at the outset. Probably the same explanation as in other acute infectious diseases pertains here.

The question of pilocarpine in pneumonia is, therefore, still *sub judice.*

Erysipelas.—Da Costa's treatment of this disease is becoming more and more the established practise. Anders[24] and Salinger[25] have given their support to it. Barr[26] has reported forty cases treated by pilocarpine with excellent results. J. W. Mitchell[27] and Wheatland[28] also report favorably. We do not hold that the disease can, except in very mild cases, be entirely aborted by the use of this alkaloid; but we do claim that local immunity is more quickly induced, while the inflammation continues to spread at the borders. The swelling and pain are very much diminished, the fever runs much lower, and danger to the nerve centers from toxemia is almost *nil.* We usually continue the administration as long as the disease continues to spread, combining or alternating its use with full doses of camphor, which has a marked effect on the temperature.

Little or no local treatment is necessarily required, but any of the customary applications may be used. Having seen two cases of indelible staining of the skin by ichthyol, we fear to use this application about the face.

Rubeola.—The classical treatment of measles is by diaphoretics and diuretics. We have found pilocarpine to be the best remedy to prevent dangerous complications and sequelæ of this affection.

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1635 SOUTH GRAND AVE.

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*THE TREATMENT OF PULMONARY TUBERCULOSIS.**

BY C. R. P. FISHER, M.D.,
Bound Brook, N. J.

The almost utter helplessness of the medical profession, when confronted with a case of pulmonary tuberculosis, has long been a reproach to the practitioners of the healing art. The fact that a case of consumption in the early stages semi-occasionally recovered through removal to a more fitting climate only accentuated that reproach, since it only proved we were powerless to stay the ravages of the disease by any other means. The further fact that autopsies, made in cases of death from other causes, frequently reveal *healed* cavities in the lung is likewise a commentary on our helplessness, for we are ignorant of the means by which such healing was accomplished. In treating a case where the patient, through force of circumstances, could not avail himself of the advantages of climatic treatment, we have been obliged to content ourselves with general supporting treatment, keeping up the general health and nutrition as far as possible, satisfied if by such means we could postpone the inevitable end for a few weeks or months.

The great and increasing prevalence of this disease makes the above state of affairs all the more deplorable. In New York City, where the Health Board requires notification of cases of tuberculosis, there were reported to the Board during the first three months of 1897, *2422 cases* and *1541 deaths*. There is every reason to believe that it is as frequently met with in many other cities, where statistics are not so readily obtainable owing to the fact that notification is not required. That the disease finds its victims in the country as well as in the cities the country practitioner knows only too well—the emaciated, stooping frame, the sallow complexion, the hollow cough, are but too well known to us all. No class is exempt, no walk of life is free from the scourge; we find it alike in the hovel of the poor and the mansion of the rich. "Hope springs eternal in the human breast," and the knowledge that rational medicine offered so little in the way of alleviation and cure has always made the phthisical patient an easy prey to the conscienceless charlatan, whose glaring advertisement of a "Sure cure for Consumption" can be found in the columns of nearly every journal in the land.

Thanks to the labors of the bacteriologists the etiology of the "Great White Death" is no longer unknown to us, and it was but natural that with the discovery of the cause our hopes of finding a cure should be raised to a high pitch. The demonstration of its contagiousness has stimulated work along the line of prophylaxis, so that advanced students of public hygiene are already discussing the possibility of stamping it out; but with the patient—the unfortunate mortal who is already in the clutches of the destroyer—the question is not "Can tuberculosis be *prevented?*" but "Can tuberculosis be *cured?*" Personally, I believe that *in the large majority of cases in the early stages pulmonary tuberculosis can be cured.*

We all remember the *furore* created a few years ago by the announcement that Koch had discovered the long sought for specific for consumption—how eagerly it was taken up by the profession, how reluctantly we were obliged to confess to negative or even harmful results. Yet Koch was upon the right track, although his original tuberculin was not a success, and while the men in active practise were obliged to lay it aside, a few earnest experimenters have gone on with the work, believing that success lay in this direction. Klebs and von Ruck in particular have labored earnestly, and have succeeded in preparing a purified tuberculin which produces results far beyond any other treatment within my knowledge.

Having a tubercular patient some four years ago, who had tried climatic treatment (Colorado) without benefit, if not, indeed, with harmful results, I sent him in the fall of

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1895 to Asheville, N. C., placing him under the advice and treatment of Dr. von Ruck, who administered antiphthisin during the following winter. The results were so gratifying that I determined to test the remedy in my practise here, and have done so in six cases, brief histories of which I present herewith. In these histories I have omitted details of other treatment—in all of them general supporting and tonic treatment was carried out. These cases were all treated at home, with either antiphthisin (Klebs) or, what I much prefer, the purified tuberculin (von Ruck), the latter producing far less irritation at the site of injection, thus rendering the treatment less painful to the patient.

CASE I.—Male, aged thirty. This case, while perhaps not coming strictly under the head of cases treated *entirely* at home, possesses such interest as showing what can be done in rather advanced cases (and having been treated at home at intervals since May, 1896) that I introduce his history here. He had a severe attack of grippe in January, 1894, from which recovery was very slow. He made a short trip to Florida in March, and took a severe cold on his return; had very profuse pulmonary hemorrhage in April, followed by tubercular peritonitis. He was ordered to Colorado in September, and returned in June, 1895, worse than when he went. Cough was constant, expectoration free and laden with tubercle bacilli. He was kept at home on general treatment until September, when I sent him to Asheville, and placed him under the care of Dr. von Ruck, by whom he was treated with antiphthisin. Patient returned in May, 1896, very much improved; cough and expectoration nearly gone, chest sounds improved, temperature and weight normal. He has attended to business here since then, with the exception of the month of March, 1897, when he was again sent South as a precautionary measure. A curious circumstance about this case is that three or four times since his return he has had attacks of ordinary intermittent fever; the resulting high temperature seemed each time to light up the old lung trouble, as evidenced by immediate return of cough, expectoration, and râles over the affected area, but each time three or four weeks' treatment with the tuberculin removed all these symptoms, and he goes along nicely until some other slight intercurrent illness disturbs the nutrition and temperature.

CASE II.—Male, aged thirty. Taken with grippe March 12, 1896. History of gradually failing strength during winter; severe pulmonary hemorrhage April 19; slight dulness and moist râles over part of upper lobe of left lung; copious night sweats. Commenced treatment with tuberculin May 13; at that time temperature ranged from 98.4° to 99.4°; weight 159 pounds. Treatment continued to July 28, when temperature was 97.4° to 98.6°; weight 168½ pounds; no night sweats; no physical signs. He resumed work as a bookkeeper in New York in September, and has not lost a day since. He is now apparently in perfect health, and weighs 170 pounds. This case I consider absolutely cured.

CASE III.—Male, aged about fifty, apparently in good health until August 9, 1896, when he had a severe hemorrhage from the lungs. Sputum mixed with blood until August 20. Lungs examined on September 7. There was slight dulness on percussion over left apex, crepitant râles, prolonged expiration; very little cough; night sweats; temperature 98° in morning, 99.6° in evening. Commenced using antiphthisin on September 16. Patient insisted on going to his business in New York every day, and in all kinds of weather, and absolutely would not take reasonable care of himself. Nevertheless he improved, appetite returned, cough diminished, night sweats lessened and ceased finally about November 1. Treatment continued until December 24, when he objected to its further use. At that time his weight had increased to normal, appetite and color good, and he expressed himself as feeling perfectly well; there was, however, a slight cough still, and roughened respiratory sounds over affected area. He was urged to return later for another course of tuberculin, but he did not do so, and was lost sight of until his death, which occurred suddenly, from hemorrhage, on July 14, 1897.

CASE IV.—Female, aged thirty-five; anemic since childhood; very delicate; slight hacking cough; dulness over right apex; prolonged expiration; loss of flesh; temperature rising to 99.6° in the afternoon. Commenced treatment November 7, 1896; continued improvement till July, 1897. The dulness has disappeared; there is now no cough; temperature and weight normal. This patient I consider cured, though owing to naturally feeble blood-making power she is still under observation.

CASE V.—Male, aged forty. Slight hemorrhage in June, 1896. He came under observation in October, when he had hacking

cough with loss of strength, was steadily losing weight, and had chronic pleurisy over lower lobe of right lung. Commenced tuberculin October 14, 1896. Improved very slowly during the winter. In May the cough had almost entirely disappeared; he had increased in weight to above the normal average; but there were still some friction sounds over affected lung. This man is doing outdoor work every day in all kinds of weather, and is up to his normal strength and weight. While I do not consider him cured, he can be classed as greatly improved.

CASE VI.—Female, aged forty-four, giving a previous history of semi-invalidism since typhoid fever in early womanhood, slight pulmonary hemorrhage in 1885, and chronic ulceration (tubercular?) of neck of bladder for many years. She came under treatment in April, 1897. Had cough, loss of appetite, strength, and weight; prolonged expiration over both apices; evening temperature 99.8°. Treatment continued until July, when both the general condition and the physical signs had so much improved that it was discontinued until October, when it was resumed for two months, as the patient had contracted a severe cold. At this time her cough has almost entirely disappeared, temperature is normal, no physical signs excepting slightly prolonged expiration, weight above normal, appetite and color good. Very much improved, but still under observation.

Of course the use of the tuberculin does not obviate the necessity for using every other means in our power to improve the general condition of the patient. We do not throw aside our sprays, stimulants, concentrated nourishment, etc., in treating a case of diphtheria because we are using antitoxin; so in treating a case of pulmonary tuberculosis, while we use the purified tuberculin, we must also see to it that the patient must be well nourished, that his digestion must be as good as possible, that he must be properly clothed, must take the proper kind and amount of exercise, must avoid taking cold, must have as much fresh air as possible—in short, we must exercise a judicious supervision over his whole mode of living. The key-note is: plenty of proper nutrition to make good blood, and plenty of fresh air to keep that blood properly oxygenated.

I was careful to say in the beginning that I believe that cases *in the early stages* can be cured; no remedy can replace lung tissue which has already been destroyed. It is possible, of course, to benefit advanced cases, to ameliorate their condition, perhaps to lengthen their lives; but unless the inroads of the disease can be stayed while there is yet sufficient healthy lung tissue to do its work properly, a *cure* is manifestly impossible.

"One swallow does not make a summer," and I am well aware that six cases is a very small number upon which to base any conclusions; but it seems to me that they are valuable both in showing the good results of this treatment and also in showing that these results can be obtained *at home*. Of course climatic treatment is of great benefit where patients can afford to avail themselves of it, but unfortunately many of our cases are so circumstanced as to render it impossible for them to go to Colorado, California, the Adirondacks, etc., nor can they all avail themselves of the advantages of treatment in a sanitarium, though this is undoubtedly to be recommended in suitable cases.

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*ESOPHAGOTOMY FOR JACKSTONE IN THE UPPER ESOPHAGUS; DEATH FROM EXHAUSTION.**

BY W. W. KEEN, M.D.,
Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia.

Ella D., aged thirteen months, was admitted to the Jefferson Hospital March 30, 1897. At five o'clock on March 27, while on the floor with other children, the child was noticed to have something in her mouth. A moment later she strangled. The mother attempted to clear the throat with her finger, with which she could feel a foreign body, but could not remove it through the mouth. She, therefore, tried to push it down into the stomach. Solid food was given the child in order to facilitate its being swallowed. The child was unable, however, to swallow the solid food and only took the breast milk.

On the 29th of March the child was first brought to the out-patient department, and I saw her. The mother stated that she had swallowed a jackstone. A most careful examination of the throat in the laryngological department did not reveal any such foreign body, nor did external palpation. I did not attempt to withdraw the body or to probe for it, but had a skiagraph taken immediately by Professor Coplin. This showed the jackstone

*Read before the Surgical Section of the College of Physicians, April 9, 1897.

opposite the bodies of the fourth and fifth cervical vertebræ. The next day the child was brought to the hospital and operated upon. The finger could not touch the jackstone, but a pair of curved forceps for foreign bodies in the urethra were found to serve the best purpose. With these the foreign body was caught several times both by Professor Hearn and myself, but it was so firmly embedded that by no possibility could it be extracted. The choice then lay between esophagotomy and gastrotomy. The ingenious snare of Dr. A. C. Wood was tried, but it was impossible to get the whalebone bougie past the jackstone; it seemed entirely to fill the esophagus. The child had a very short neck, but I finally decided to do esophagotomy in view of the high position of the jackstone.

An incision was made in the left side of the neck; the sterno-cleido-mastoid and the vessels were drawn outward and a large arterial branch, presumably one of the thyroids, and a large vein were ligated. These were the only two vessels requiring ligation. The recurrent laryngeal nerve was looked for, but was not seen. As soon as the trachea was discovered and back of it the esophagus, the rounded knob of the jackstone was perceived, both by touch and sight. The tissues of the esophagus around it were already beginning to slough. An incision was made over the foreign body, and it was extracted with considerable difficulty and as slight laceration of the parts as was possible. The wound in the esophagus was closed by three catgut sutures and the external wound was packed with iodoform gauze. At the end of the operation the child was very comfortable and in good condition.

The child was fed every four hours for forty hours by the rectum with milk, and twenty drops of whiskey. On April 1, 1897, at 6 A.M., the child nursed for the first time and took food very well. A slight amount of milk passed into the wound, necessitating the change of the dressing three times in the twenty-four hours. The child did not seem to be particularly hungry, fretful, or restless, and I saw no reason to suppose it would not do well. The wound was doing admirably. At 3 A.M., on April 2, she became very restless and died at 3 P.M., apparently from exhaustion. The highest temperature immediately after the operation was 99.6°, but on April 1 it rose to 101.4°.

The two points worthy of attention in this case are, first, the method of removing the obstruction, and secondly, the cause of death. Although the child's neck was very short and fat, I decided on esophagotomy on account of the high position of the jackstone. The operative result showed that this was the better plan. I doubt much whether in so young a child the jackstone could have been safely removed by the method adopted by White and Wood in their two cases (*University Medical Magazine*, June and October, 1896). There would have been very severe laceration, I think, of the esophagus above or below the obstruction.

For two days after the operation I fed the child by the rectum, and as she seemed entirely satisfied, was not restless, fretful, or in any other way exhibited signs of hunger, I did not deem it best to feed by an esophageal tube. I regretted afterwards that I had not done so. The child took the breast milk on the sixth day very well, but did not show any special signs of hunger or exhaustion till twelve hours before death.

REMOVAL OF A CANCEROUS THYROID.

REVERDIN (*Journal de la Suisse Romande*, Dec. 20, 1897) operated upon a malignant growth of the thyroid because of the dyspnea produced. Adhesions prevented complete removal; there was much bleeding; patient died the next day. Microscopic examination showed that the growth was sarcomatous.

Important diagnostic signs of malignant tumor are dysphagia, radiating pains, edema of the thoracic walls and upper portion of the sternal region. Dysphagia is sometimes caused by retro-tracheal simple goitre, but is rarely absent in malignant neoplasms. The patient did not complain of dysphagia, but autopsy showed the growth extended backward between the trachea and esophagus, limiting mobility of the latter by adhesions. Dyspnea was most pronounced. A colloid growth existed before, but the patient had never noticed the tumor. There was no edema of the external parietes, and thrombosed veins were not encountered during operation. The jugular vein was free; the carotid artery was invaded. Rapid development of paralysis of vocal cords by compression, recurrent radiating pains towards the ear, rapid emaciation and marked interference with respiration were all noted.

When this disease manifests its characteristic symptoms it has acquired such extensive adhesions and has so widely infiltrated that complete removal is exceedingly dangerous to life, and not likely to arrest the disease.

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EDITED BY
H. A. HARE, M.D.,
GENERAL THERAPEUTICS,
AND
EDWARD MARTIN, M.D.,
SURGICAL AND GENITO-URINARY THERAPEUTICS.

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Leading Articles.

THE TREATMENT OF NEPHRITIS.

Acute nephritis is by no means so frequently met with as the more chronic inflammatory conditions which produce such disastrous results; yet it is sometimes seen, either as the result of the ingestion of irritant substances or of the presence of severe infections. Some persons have gone so far as to assert that acute nephritis may result from severe exposure. Whatever its causes may be, if it is of a severe character a train of symptoms familiar to experienced clinicians assert themselves. There is a condition of malaise, with anorexia and perhaps nausea and vomiting, while if the condition of the kidneys be grave these symptoms may be followed or supplanted by violent headache, followed by delirium, convulsions, and coma, during which the heart will be found acting laboriously and the pulse will be of high tension. The urine will also be decreased in quantity and the patient may develop rather a typhoid appearance. This condition may last, if not so grave as to produce death early in its course, for several weeks, and at that time, unless the case has been badly treated or has been unusually severe, recovery takes place, or at least the patient becomes so improved in health as to consider himself well.

The most important thing to do for any patient who is suffering from mild or severe acute inflammation of the kidney is to insist upon absolute rest, the patient remaining in bed not only for the rest, but also in order that the surface of the body may be protected from draughts and colds. A liquid diet, consisting largely of milk, should be insisted upon, and this liquid diet has the additional advantage that it will tend to increase the quantity of urine and so help to wash from the kidneys the effete materials which it is the function of these organs to eliminate. On the other hand, it must not be forgotten that during the course of acute nephritis the kidneys are unable to eliminate as much fluid as they can do in health, and the too free administration of liquids under these circumstances may to some extent aid in increasing the tendency to dropsy. For this reason scantiness of the urine in acute nephritis is not to be considered as a very grave symptom, but if it becomes exceedingly scanty and does not show evidences of being thoroughly laden with excrementitious matter, and if it seems probable that this failure of action on the part of the kidneys is due to congestion, it then becomes the physician's function to relieve that congestion by one or several measures. Dry cups or even wet cups may be applied over the lumbar region, provided that hot compresses applied to this area for an hour or two fail to relieve the congestion. Or in other cases it may be well to cause a flow of blood to the surface of the entire body by placing the patient in a hot wet pack.

As purgatives not only relieve congestion of the abdominal viscera directly, but also seem to indirectly stimulate the kidneys to increased secretion, probably by relieving engorgement, and as calomel is a purgative which is supposed to possess considerable diuretic power, this or some other more rapidly acting drug, such as the sulphate of magnesium, may be given, and this will also aid the body in eliminating poisons through the bowel. Should the arterial tension be great, we are not to forget that in the presence of acute inflammation with high arterial tension, aconite and chloral are valuable drugs which are best given in small doses rather fre-

quently rather than in full doses far apart. Should evidences of cerebral congestion manifest themselves, it may be necessary to resort to hot foot-baths or to actual venesection, the patient being also purged by repeated small doses of Epsom salts. As the end of the period of acute inflammation is approached the anemia, which has probably been gradually increasing, is to be combated by the use of iron and arsenic, though the latter drug is to be administered cautiously lest it irritate the kidney, and solid food may be employed in place of the liquid diet heretofore insisted upon. Oxygen inhalations are also useful to some of these cases. The greatest attention should also be paid to maintaining an active condition of the skin by frequently sponging it with alcohol, or if the patient is strong enough, by frequent washings.

Where the condition of the kidneys is more chronic, or in other words subacute nephritis is present, the patient should be advised, if possible, to resort to a warm and equable climate, to clothe himself most carefully, to avoid wetting the feet, and to limit his diet both as to fluids and solids. The rule in regard to fluids should be that they should not exceed to any great extent the quantity of urine which is passed, although, of course, an amount of liquid over and above that which is passed must necessarily be swallowed to make up for that which is lost through the skin and lung. This is particularly necessary in patients who are suffering from dropsy, more or less well developed. Should the patient not be passing water freely, copious draughts of fluid may be given to him with the object of aiding his kidneys in getting rid of the quantity of urea which should normally be eliminated and which amounts approximately to about 500 grains. If the physician is properly cautious he will from time to time analyze the urine to determine whether the normal quantity of urea is being eliminated, and should it constantly fall below the normal he will know that there is danger of the development of uremia and cerebral symptoms, and arterial tension should be lowered and diuresis encouraged by the use of nitroglycerin. If the dropsy in any case is sufficiently severe to result in large effusions into the various visceral cavities, there is nothing left to do but to recognize the fact that the condition of the kidney is grave; that the prognosis is distinctly unfavorable, and the only measure for relief in addition to those named is the use of tapping for the purpose of drawing off the liquid. If, as occurs in some cases, where the disease is advanced, arterial tension is depressed rather than raised, digitalis in the form of the infusion, which contains more of the diuretic principle of the digitalis (digitonin) than alcoholic preparations of this drug, should be employed for the triple purpose of stimulating the heart, the arterial system, and increasing urinary flow.

THE VALUE OF BARIUM CHLORIDE IN HEART DISEASE.

As is well known to pharmacologists, barium chloride in small quantities possesses a physiological action closely allied to that of digitalis so far as its influence upon the heart is concerned. Thus it slows the heart very greatly, steadies its rhythm, and markedly increases the quantity of blood which is thrown out of the ventricle at each contraction. At the same time it increases blood-pressure, as has been proved by the careful studies of Kobert, of Dorpat; and it would seem probable, from the studies of this investigator and others, that it exercises a more powerful systolic influence over the ventricles than does digitalis, the slowing of the pulse being due rather to an excessive systolic action of the drug and to high arterial tension than to any effect which the drug may exercise upon the pneumogastric nerve. The drug is therefore one which apparently should prove useful in a certain proportion of cardiac diseases, which for one reason or another fail to obtain benefit from digitalis, which, of course, is its superior in the majority of cases.

Following these theoretical conclusions, quite a large number of clinicians have employed this drug in the treatment of heart disease with failing compensation, both in adults and children, particularly when the pulse is weak and irregular and is lacking in volume. We have used the drug in a number of cases, some of which we have reported in a communication made some years ago, and in other cases which have not been contributed to medical literature, and we have reached the conclusion that it is of value, but must take a place after both digitalis and strophanthus as a cardiac tonic. The dose for an adult is a teaspoonful of the one-per-cent. solution three times a day to an adult, or one-half this to a child of from six to ten years. These doses are not capable of causing irritation of the gastro-intestinal

tract, and very much larger doses of barium are required before it will act as an irritant poison. There are, therefore, no reasons why it should not be tried in the care of cases which we have mentioned.

THE TREATMENT OF OBSTINATE HEADACHE.

The intention of this editorial note is not to deal with the treatment of headache by the ordinary remedies such as the coal-tar products, but rather to call attention to the use of another substance which, while it has more limited usefulness, is nevertheless capable of giving marked relief in a certain proportion of cases where acetanilid, phenacetine and similar compounds failed. As long ago as 1889 Lewis and de Schweinitz reported no less than eight cases of violent headache, which had resisted other forms of treatment, which were benefited by the use of the oil of eucalyptus. In the first of these, violent occipital headache with zigzag lines and prodromal hallucinations was entirely unaffected by the administration of full doses of quinine, although there was a marked malarial history. Further than this, correction of errors of refraction did not give relief, but the exhibition of five minims of the oil of eucalyptus five times a day caused a complete cure. In another instance in which there was neither malarial nor rheumatic history, but a severe occipital headache of the congestive type, similar doses of oil of eucalyptus gave relief unless the headache was distinctly dyspeptic. In still another instance a patient suffering from occipital headache of the congestive type, and in whose case cannabis indica and antipyrin were utterly useless, not only was relieved of the individual attacks, but was able to prevent subsequent ones by a few doses of the drug. Perhaps the most interesting case that they report is that of a woman of thirty-three years, with a gouty family history, who had been for some time a great sufferer from hay-fever and who had also suffered from violent headaches of the congestive type, the pain being of a jumping character and spreading over the head, there being associated intense injection of conjunctiva and swelling of the face. In this case, also, the ordinary headache remedies failed, but the oil of eucalyptus given in doses of five minims every four hours gave great relief during the paroxysm, but was most efficient when exhibited during the prodromal period. Since these studies which we have quoted other investigators have employed the oil of eucalyptus in a considerable number of cases with advantage, and while it is not a remedy which is suited to every case, nor agreeable to take, and while in a certain proportion of cases it may produce disorder of the stomach, it is at least to be remembered when the physician is called upon to treat obstinate forms of head pain not dependent upon morbid growths.

SALOL CALCULI.

It is not often that insoluble drugs are given for so long a period of time that they accumulate in the alimentary canal and form one mass which may or may not be capable of producing evil effects, and yet every now and again medical literature contains the report of a case in which the prolonged use of some such substance has resulted in the formation of a gastric or intestinal calculus. In this connection it is interesting to note the report made by Mr. Marshall in a recent number of the *British Medical Journal*. Marshall received from Dr. Bradbury an almond-shaped, crystalline mass, possessing a yellowish color, and weighing about one gramme. This mass had been vomited by a young lady who had been taking salol for some months for the relief of intestinal flatulence, and it is interesting to note that the administration of the drug had resulted in marked benefit. After six months had elapsed, during which time she had taken as much as ten grains once or twice a day, she had a very severe attack of colic, with violent vomiting, which nothing would relieve except the administration of morphine. In one of these attacks the calculus already mentioned was vomited, and it was stated by the patient that she had frequently passed similar masses by the bowel. The substance had a salol-like odor and gave the chemical tests of this compound. Further analysis showed that it was practically pure.

Another case by Brossard was reported in the *British Medical Journal* of April 24, 1897, and was that of another female who suffered from gastric dilatation, with paroxysmal gastralgia and frequent bloody vomiting. As the patient refused lavage, the treatment consisted in the administration of large doses of alkalies and a milk diet with salol and calomel in combination. Enormous doses of salol were used, as much as sixty to seventy-

five grains a day. Ten days later the patient (who was usually constipated) suffered from symptoms of intestinal obstruction which lasted for thirty-six hours, notwithstanding the use of purgatives and large enemata and the application of electricity. Finally a movement of the bowels was obtained, and thinking that the pain from which the patient had suffered might be due to a biliary calculus, the stool was carefully washed. About ten calculi were found, the largest of these weighing about thirty grains, and several other small calculi were passed in the two following movements. They all consisted of pure salol.

As Marshall points out, an interesting point in his case is that the calculus occurred in the stomach. In only one other instance is a similar condition reported. Thus Girode, in a case of cholera that had been given salol two days before death, found two masses of salol weighing forty-five grains in the stomach at the post-mortem examination.

Brossard concluded, after consulting a chemist, that the salol had remained unaltered, and thought it was exceedingly improbable that it had been first decomposed and then its constituents reunited. On the other hand, it has been found by experiment that a solution of carbolic acid, which is one of the ingredients of salol, causes powdered salol to agglomerate and after some time to melt, and this occurs very readily at about the temperature of the stomach and intestine during the active processes of digestion. As a result the fluid thus produced is readily caused to solidify when the gastric temperature is lowered by the cessation of digestion or the drinking of cold water, and recrystallization occurs. Marshall believes that salol calculi exist more frequently than is generally thought, and also that some gastro-intestinal disease is necessarily present as a predisposing cause to their formation. It is therefore evident that salol is best administered not in plain powder or in pill, but that it should be subdivided by being rubbed up with some innocuous powder, or given in emulsion as originally recommended by Sahli, as by this means the possibility of a calculous formation is reduced to the minimum. Ordinarily we are accustomed to think that the administration of this drug, even should it fail to be dissolved by the intestinal juices, is incapable of producing deleterious results, but Marshall's interesting report indicates that when it accumulates in the intestine or stomach it may produce serious consequences.

REDUCTION OF THE DEFORMITY IN POTT'S DISEASE.

In various journals there have recently appeared articles strongly advocating the rapid forcible reduction of the deformity of Pott's disease. The more important of these communications will be found abstracted in the THERAPEUTIC GAZETTE. Some have apparently been founded on extremely limited experience; others upon a most extended and exceedingly successful series of cases. The contribution of Wolff in the *Berliner Klinische Wochenschrift* of February 14 and 21, 1898, reviewing as it does the entire subject, is extremely timely. He points out that Hippocrates states that forcible reduction of the deformity in early cases of Pott's disease was a time-honored procedure. Aurran and David more than a century ago advocated reduction of the deformity by mechanical means, pressure, however, being applied gradually. The teachings of these men were followed with modifications by many others. Forcible reduction was, however, at no time popular. In later times the efforts at reducing deformity have been confined to treatment by Sayre's corset, by suspension, or by various forms of extension.

Three years ago Chipault revived the treatment of forcible reduction under an anesthetic, fixing the spinous processes to each other by means of silver wire, an obviously useless procedure. In 1896 Calot's article appeared. He advised not only stretching the spinal column, but breaking it in two pieces so that the fragments might be put in proper position in regard to each other. The object of his procedure was not merely to lessen deformity, but to cure the spondylitis, and this he stated he had succeeded in doing, claiming for his method that the cure was rapid, safe, and without deformity.

Calot compared the deformity of Pott's disease to that resulting from tubercular inflammation of the hip- or knee-joint. When the disease is of short standing—*i.e.*, has not lasted more than a few months—the irregularity is corrected under narcosis in the following way: Two assistants at the head and two at the legs of the patient make forcible extension and counter-extension, while the surgeon presses with his full force on the projection. As a result the prominent vertebræ sink to the level or even beyond the level of the remaining bones of the spinal column. There is often heard a cracking, showing that the spinal column is broken. The bones

can then be put in proper position. For the purpose of keeping the bones in this position a plaster bandage is applied extending from the head to below the hips. This is applied while the narcosis is still kept up, the parts which it encloses being first enveloped in a thick layer of cotton. It is especially reenforced about the region of the kyphosis. This enables the surgeon to apply the gypsum bandage very firmly. The bandage is allowed to remain in place three or four months and then replaced by another. After the second or third corset the patient may be regarded as convalescing and can wear an apparatus which can be removed. The cure of the deformity requires from five to ten months.

This procedure Calot, to quote his own words, slightly modifies. Instead of wiring the spinal processes together, as does Chipault, he resects their extremities and together with them a portion of the often cicatrized skin which lies directly over them. When the deformity is four to eight months old the method is stated to be absolutely and completely satisfactory, and Calot believes that if surgeons generally taught this method every child suffering from Pott's disease would not only be cured, but would grow up without any appreciable deformity. Even when the disease is four to eight years old and bony union has fixed the vertebræ in their false position, complete cure is still possible. In such cases Calot has made a wedge-shaped resection, the base of the wedge being backward and embracing the prominent hump. Posteriorly he removed portions of the three vertebræ, exposing two and a half inches of the spinal cord, which was drawn aside when completing the excision of the wedge. The callus was chiseled through sufficiently to allow the bones to be separated by means of traction and pressure, after which the spinal column was put in proper position.

Among his first thirty-seven cases Calot observed no death. In but one instance was there paralysis of the leg, which proved transitory. Four times ulcers developed under the bandages; these quickly healed. In two cases abscesses developed. Calot exhibited six of his patients before the Academy of Medicine, showing apparently extremely gratifying results.

The claims which Calot makes for this method seem extravagant. Thus, as to the rapidity and thoroughness of cure of tuberculous affections of the spine of similar nature to those involving other bones, it has long since been shown that cure is by no means accomplished by securing the bones in proper position in regard to each other; indeed, a forcible reduction often seems to stimulate the rapidity of tuberculous involvement.

As a matter of fact, Murray has shown by post-mortem examination that reduction of deformity by no means stops the tuberculous process. Menard has proven by cadaveric experiments that the straightening of the angularity may cause a separation of from one-fifth of an inch to one and a half inches of the anterior portions of the vertebræ, a gap which cannot be filled by bony material. Calot's *x*-ray pictures, intended to show that this breach is filled in, are, according to Wolff, not satisfactory.

The accidents and difficulties encountered in practising this method of forcible reduction are many.

Brun records a death immediately following the reduction, due, he states, to chloroform. Civel records a death of bronchopneumonia immediately after the procedure. Malherbe treated a boy aged twelve with a gibbus of eight years' standing; the patient became cyanotic, suffered the next day from violent pains in the back and extremities, and died of dyspnea on the eighth day. Section showed there was complete fracture between the ninth and tenth dorsal vertebræ, and a blood-stained exudate in the left pleural cavity. Bilhaut reports three deaths. Joannesco has attempted the method thirteen times and lost three cases. One he attributes to chloroform; in one the cause is not given, although the patient died in forty-eight hours; the third died of bronchopneumonia caused by the reduction. Vulpius noted that a patient could not be restored to consciousness after the anesthetic; the temperature steadily rose, and forty-eight hours later the patient died in coma. Calot himself records two deaths within a few days after the reduction of the deformity. Malherbe observed threatened syncope forty hours after reduction of the deformity, relieved only by removal of the dressing and the restoration of the gibbus. Vincent in three cases found it impossible to reduce the deformity. In five other cases he noticed that even though the deformity was reduced, it recurred under the plaster bandage. The majority of surgeons who have attempted this method hold that its merits and dangers have not yet been settled, and that they must be determined by further trial.

Wolff, however, states without hesitation that this is unnecessary, and that Calot's method should be rejected without qualification, basing his conclusion on Calot's own work. Thus, he states that he has seen the French surgeon reduce deformity in three cases, but in a manner absolutely different from that which he describes. He has utterly abandoned open resection and powerful pressure, advising instead extreme gentleness. Efforts at replacement are continued for only a few seconds and consist in traction upon the spinal column, varying from 40 to 160 pounds, and pressure applied on either side of the gibbus by the thumbs of the assistant exerting a force of from 26 to 80 pounds. The trauma, he states, is no greater than that incident to permanent extension.

This modification is not to be commended, since it accomplishes little and since it is followed by an apparently unnecessarily cumbersome, confining and irksome dressing reaching from the head to the hips. Nevertheless Wolff holds that Calot's contribution and the discussion to which it has given rise have been of extreme service, since they encourage the surgeon in making more vigorous efforts at reducing deformity.

Wolff believes he has, profiting by this method, elaborated a method of treatment which will accomplish much better results than could be hoped for by either the older or the more recent method. He has practised it in twenty-four cases. It consists in the correction of the deformity by suspension and pressure and the immediate application of a plaster bandage. This correction and adjustment of a new plaster is repeated every few days or weeks. The dressing is applied without ether, does not threaten life in a healthy patient, does not break or tear the vertebræ, occasions but slight pain, and does not require the application of a heavy bandage such as the one which Calot advises. Patients are suspended in the ordinary way, the hips being fixed by proper supports. The shoulders are held by an assistant. The assistant presses firmly on either side of the gibbus with the point of the thumb and the middle joint of the forefinger as the extension is applied, and maintains his hand in this position while the plaster is put on. This protects the bony projection formed by the spinous processes from direct pressure. After repeated applications of the plaster very decided improvement is noted. A number of illustrations are given showing the astonishingly good results.

Reports on Therapeutic Progress

ON THE TREATMENT OF SOME OF THE MORE COMMON EYE AFFECTIONS.

The *Edinburgh Medical Journal* for November, 1897, contains a continued article by Mr. BERRY with this title, in the course of which he tells us that the treatment of cases of conjunctivitis with marginal ulceration of the cornea should be the same in most respects as that devoted to the cure of keratitis or conjunctivitis alone. Lead lotions must, however, be avoided, as they lead to dense white deposits in the cicatrices, which remain after the ulcers have healed. Where the ulcers are superficial and small, a drop or two of a weak nitrate of silver solution (one grain to one ounce) may be dropped into the eye, after an irrigation with boric acid lotion, once daily for three or four days. This often at once induces healing, even in cases where the ulcers have continued in much the same state previously for a couple of weeks or longer. The ulcers often cause a good deal of pain. To allay this, cocaine may be used (two- to five-per-cent. solution of hydrochlorate), but it is not advisable to apply it very frequently—for instance, every half-hour, as is often done. Immediately before and after each irrigation is sufficient to give relief. It is a good plan, too, to instil a few drops into the eye the last thing at night, as the local anesthesia thus caused often allows the patient to fall asleep, which the pain otherwise prevents. Eserine drops are often recommended for the treatment of catarrhal as well as for other forms of corneal ulcer. The writer has never been able to satisfy himself that they are of any use at all for this purpose, and as they are sometimes actually hurtful, they should not be used. Dark glasses are particularly indicated in all cases of conjunctivitis with marginal corneal ulceration.

Deeper and more rapidly extending marginal ulcers should be brushed once or twice with chlorine water (full strength), or if this is not available, with a two-per-cent. solution of nitrate of silver. The brushing, to be effectual, should be done with some force, the camel's-hair brush being dabbed on to the ulcers several times so as to bring the antiseptic properly in contact with all parts of their surface. By using cocaine this can be done without causing any pain to speak of. Afterwards, dusting with finely powdered iodoform is useful after each irrigation. The

application of iodoform in powder is preferable to its use either in ointment or in gelatin disks, the latter of which dissolve in a few minutes and leave only a comparatively small quantity of the iodoform *in situ*. When deeper marginal corneal ulcerations exist, in the absence of much conjunctival secretion, it is sometimes a good plan, if they do not tend to heal, to cover them with a flap of conjunctiva. This is done by undermining the surrounding conjunctiva with scissors and stitching it forwards.

The main characteristics of the forms of conjunctivitis which have been so far considered are the nature of the secretion from the inflamed mucous surface and the rarity of corneal complications.

In purulent conjunctivitis, on the other hand, serious corneal mischief has always been dreaded. There are, probably, several causes of purulent inflammation of the conjunctiva. Much the most frequent cause, and the one which gives rise to changes which may be taken as the type of those caused in other ways as well, is the gonococcus inoculation. This is met with as gonorrheal ophthalmia and in new-born infants as ophthalmia neonatorum.

Apart from the copious and distinctively purulent secretion of gonorrheal conjunctivitis, which shows itself in two or three days after the first symptoms of irritation have begun, there is rapidly developed a great, often an excessive, inflammatory swelling and tenseness of the eyelids. The ocular conjunctiva and subconjunctival tissue is also swollen, tense, and edematous. This is what is called chemosis. In a few days the tenseness in the lids and ocular conjunctiva, especially the former, subsides, but the pus continues to be formed in great quantity.

It is important, and usually not difficult, to recognize early the specific nature of the conjunctival inflammation. The tense swelling of the lids and chemosis are, in fact, characteristic. The only thing which might mislead one is the appearance presented by severe cases of a muco-purulent type which have been persistently poulticed for a day or two. But even in these there is an absence of the hard, tense swelling presented by most cases of gonococcus or similar infection.

Having regard to the grave consequences to the cornea which a purulent conjunctivitis may entail, the treatment has to be considered not only from the point of view of what is best for the infected eye, but also with regard to prophylaxis in the case of the other eye. Indeed, the first thing which should always be done whenever there is cause to diagnose a gonorrheal or other purulent conjunctivitis of the one eye, is to actively disinfect the other, and then secure it against the risk of subsequent infection—a risk which, it must be remembered, exists so long as the purulent discharge continues. The disinfecting of the sound eye is of course undertaken on the supposition that it may possibly have been recently inoculated, and may be done in the following way: After dropping a little cocaine solution into the conjunctival sac, the lids are everted, and the mucous surfaces, including as far as possible the folds, painted over with chlorine water. The lid margins are then rubbed freely with little pledgets of absorbent cotton-wool moistened in the same antiseptic. This is followed by a free irrigation of the whole conjunctival sac, with not less than a pint of a two-per-cent. boracic acid solution. A little iodoform or boracic ointment is lastly rubbed along the lid margins and the occlusion bandage applied.

The first indication to be complied with in adjusting an occlusion bandage for this purpose is, of course, to secure the eye from any chance of becoming inoculated by the purulent secretions from the other side; the main risk of such inoculation occurs at night. When the discharge is copious, and the patient lies on the side of the sound eye, some pus may readily find its way across the bridge of the nose, or even be transferred unconsciously by the patient's hands. Such an accident may be prevented by covering the sound eye with a good-sized pad of absorbent cotton-wool, held in place by a properly applied bandage. The following plan may be recommended: Next the eye—*i.e.*, immediately over the closed lids—place a circular piece of lint (two to two and a half inches in diameter) which has been dipped in boracic lotion. Powder a little iodoform over its inner edges, and then cover this with a pad of absorbent cotton-wool, which, to the inner side at all events, projects a little beyond the lint. The pad is then secured first by two pieces of thin tape plaster (one-fourth or one-half inch), placed diagonally across it from forehead to cheek, and further by a domett or thin flannel bandage, eight to nine feet long and two and a half inches wide. One turn of the bandage may first be taken round the head, beginning from the opposite side to that of the eye which is to be covered; the next turn is carried down over the pad below the ear; and the third over the upper part of

the pad, and covering in the ear. This occlusion bandage need not be changed more than once every second day. Such a bandage, while efficiently preventing direct inoculation, has the disadvantage of depriving the patient of the use of his eye. In most cases this is tantamount to keeping him in the dark altogether, as the pain and swelling of the lids make it impossible to see with the affected eye. This privation, added to the trouble and anxiety which his condition cause him, has a very depressing effect upon the patient. It is therefore better, as soon as possible, to adopt some arrangement whereby sufficient protection is provided against inoculation, while at the same time the good eye is not altogether thrown out of use. The simplest and most readily prepared contrivance of this nature is what is known as Buller's shield. This consists of an ordinary watch-glass fixed in an aperture between two pieces of adhesive plaster. The shield may be made and applied in the following manner: After cutting out a rectangular piece of paper five inches long by four inches broad, this is held over the eye in such a position that its inner border just covers the middle ridge of the nose, and its lower border lies horizontally on a level with, or slightly below, the lowest point of the nostril. A circular opening half an inch or so less in diameter than the watch-glass which has been procured for a window is then cut in the paper, the center of which should coincide as nearly as possible with that of the pupil when the eye is directed straight forwards. From this paper pattern two pieces of rubber or other adhesive plaster are cut. Then, holding these two pieces together with their non-adhesive surfaces in contact, and so that edges and apertures exactly coincide, a strip one inch wide is cut off the top and one-half inch wide off either side of one of them. The watch-glass, with its concave side downwards, is laid on the adhesive surface of the smaller piece of plaster, so as to cover in the opening, and the plaster securely fixed round the concave rim of the glass in this position. This piece with its glass is then fitted to the other, so that the two lie with their adhesive surfaces in contact in the same position as they did when the surfaces were reversed. There is thus formed a shield, three margins of the under surface of which can be readily fixed along the forehead, down the side of the cheek, and along the nose. The lower edge is not plastered to the face, so that air gets in behind the shield and prevents dimming the glass.

In applying the shield the watch-glass should be secured in a suitable position in front of the eye, and particular care should be taken that the margin along the nose adheres tightly. An extra strip of plaster may with advantage be fixed over this margin. The advantage of Buller's shield over a regular occlusion bandage is not confined to the relative comfort which the patient obtains; an additional advantage is that it does not as a rule require to be changed, as it admits of a ready inspection of the eye by the surgeon.

In the treatment of the inflamed eye everything must be done which is calculated to prevent the cornea becoming involved. It is well to recognize that the main, if not the only, cause of an accompanying corneal ulceration is an inoculation with the specific discharge in places from which the protecting epithelial surface has been removed. The denuded cornea is certainly easily inoculated. Possibly inoculation may take place even when the epithelial covering remains intact. It certainly does not do so readily, and therefore from a clinical point of view it is well to keep before one the desirability of providing as far as possible for the protection of the epithelium. Careful handling is therefore a most necessary precaution. Removal of the epithelium is too often caused by forcible opening of the swollen lids. Owing to the pain and swelling of the lids, it is no doubt often difficult to get a proper view of the eye without using some force. Perhaps the best plan is to instil a few drops of a solution of cocaine (two to five per cent.) into the eye, and then separate the lids by the finger-tips applied to their margins, taking care not to allow the nails to scrape on the cornea. Indeed, the use of the cocaine should be as much to facilitate gentle handling as to diminish the pain which an examination causes the patient. This is often forgotten, yet it is of great importance. Cocaine should only be used during any manipulations which the treatment renders necessary, not at other times. Elevators or speculum should in general be avoided, and when introduced, and whilst *in situ*, must be kept held away from the cornea, so that the epithelium may not be injured in any movement of the eye. Strong caustic solutions are also liable to injure the corneal epithelium when applied to the conjunctiva. Those most commonly in use are solutions of nitrate of silver and corrosive sublimate. The former should not be used on this account stronger than two

per cent., or ten grains to the ounce, and the latter not more than .002 per cent., or about one grain to the ounce. But it is better to avoid these solutions altogether.

THE BECHTEREW TREATMENT IN EPILEPSY.

DE CESARE (*La Riforma Medica*, Aug. 13, 1897) records eight cases of epilepsy treated for a period of six weeks with a mixture of bromide of potassium, codeine, and adonis vernalis, given twice a day (Bechterew treatment). In four cases there was complete suspension of the fits; in three cases the fits were replaced by infrequent attacks of vertigo; and in the last case there were four attacks of vertigo and two convulsions. In each case the attacks were very much reduced in frequency; no bad results were observed. The digestion was not impaired, the pulse was fuller, the temperature normal, diuresis increased, sleep uninterrupted and calm, and the mental condition unchanged. The author believes the results were due to the combination of drugs and not to the bromide alone.—*British Medical Journal*, Oct. 23, 1897.

"RHEUMATIC" TETANUS AND THE ANTITOXIN TREATMENT.

STEINER (*Wiener Klinische Wochenschrift*, 1897, No. 36) records two cases of interest from the point of view of etiology and therapeutics respectively. The first occurred in an apparently healthy man of thirty-eight, five days after he had contracted a chill by becoming wet to the skin. There was no obvious breach of surface, but the disease ran a subacute course, and after a month showed no signs of improvement. At the end of this time a large purulent crust was sneezed out of the nose, and from that moment the patient rapidly recovered. The crust was, unfortunately, not preserved, but Steiner considers that infection must have taken place by means of dust somehow introduced into the nose. The case would have formerly been classified as one of "rheumatic" tetanus.

The second patient was a man aged twenty-five, in whom the symptoms followed a cut of the left thumb by a fall. Here the disease was more acute, and on the sixth day the spasm, pain, sleeplessness and profuse sweating had rendered him apparently moribund. Tizzoni's serum was injected to the extent of 1125 immunity units, followed by 300 units the next day, and 825 the day after; in all 2.5 grains of the dry substance was administered. Half an hour after the first injection the patient expressed himself relieved, and he thenceforward speedily improved; the last spasm occurred the day after the final injection, but a slight rigidity of the left forearm persisted for another fortnight, together with sciatica and more marked rigidity of the adductors of the hip. The curative action of the serum was instanced by the immediate cessation of the excessive sweating, and the return of quiet and sleep, in addition to the marked subjective amelioration. Furthermore, the spasms, which had been excessively violent, ceased at once for eight hours, and those which occurred later were abortive, and for the most part painless. The temperature, which had risen to 101° F., was not at once reduced, showing that its origin must be complex.

It should be mentioned that in both cases all the ordinary drugs were ineffectually employed. From them the author draws the following conclusions: (1) An apparently "rheumatic" tetanus was really due to infection through an unusual channel. (2) This was rapidly and spontaneously cured by the expulsion of the principal source of infection —the crust from the nose. (3) Tetanus antitoxin exerts no noxious influence on the organism. (4) In one case at least it appeared to rapidly cut short the disease. (5) The judicious use of the antitoxin will cure cases that would not have got well spontaneously. Steiner strongly recommends its use in conjunction with local or symptomatic treatment. The seat of infection should first be disinfected, preferably with an iodine compound (iodoform); then large quantities of fluid should be given with the object of washing the toxins out of the organism; next physiological antidotes, such as chloral, morphine and bromide should be administered; and finally, the antitoxin injected. The author believes that the latter is not a chemical antidote, but antagonizes the toxins in complicated and physiological ways.—*British Medical Journal*, Oct. 30, 1897.

TREATMENT OF DYSMENORRHEA.

The well known gynecologist, Mr. SKENE KEITH, in the *Medical Press and Circular* of October 27, 1897, in discussing the treatment of dysmenorrhea, tells us that in every case, without exception, general treatment must be

most thoroughly tried first, because many, and certainly all the slighter cases, can be cured or much relieved in this way, and also on account of the very evident objection there is to local interference. It is fortunate that this is one of the conditions which can often be treated without actual local knowledge of the condition of the pelvic organs. The general treatment, and with it the preventive treatment, may now be considered. At the time of puberty enough attention is not given, more especially to the delicate girls, to keep up what is commonly called a good circulation. Many girls get far too little exercise—occasionally far too much and of an unsuitable kind—and far too little care is taken both at home and at school to keep them warm, especially at night. People do not seem to think it matters to let a growing girl go to bed with cold feet, or if they do, imagine that to have a hot-water bottle is coddling. A greater mistake is never made. It is essential that the feet be kept warm during the night whenever there is uterine dysmenorrhea, or indeed whenever there is any pelvic trouble. In some cases it is advisable to have the feet and legs thoroughly rubbed before going to bed.

The preventive treatment consists, then, in keeping the girl warm and in attending to her general health. When a delicate, chilly girl is developing into womanhood, a winter passed in a warm climate may make all the difference whether she is to be a strong or a delicate woman, and at the same time dysmenorrhea, if present, will usually be cured. To most, this form of treatment is not accessible, and we must rely on the avoidance of too many lessons, of too much practising in a draughty schoolroom with probably perfectly cold feet, and on the indulgence in plenty of fresh air, with outdoor exercise—not too violent nor continued for too long at a time—in going early to bed and not being up too early in the morning, in keeping warm day and night, and in the judicious use of the morning bath. Some may be able to bathe in cold water, others will require to have the chill taken off the water, and others again may do well while standing in warm water to have first tepid and then cold water poured over them, and especially down the spine. The best guide to go by is that the person must feel warm by the time she has been dried. As soon as there is the slightest appearance of the "period" the girl must be kept rigidly to bed, and not allowed to get up until the pain is entirely gone and the flow is either over, or is at least past the worst. A large poultice should be kept over the abdomen as long as there is any pain. For medicine, a brisk saline draught at the commencement, or if possible twelve hours before, and then a mild diaphoretic, with a small dose of bromide of sodium or potassium if the patient be strong, or if weak some aromatic spirits of ammonia are best. Sedatives should be avoided as a rule, and the very favorite remedy—hot gin—should not be prescribed except for the very weak people.

When the dysmenorrhea has lasted for some years, it is more difficult to effect a cure by means such as these, because secondary results have now come into play. In spite of this, they should be tried in all cases where the pain is not very severe for six months or better, for a year. It cannot be too carefully explained that this general treatment is not meant only to relieve pain at the time, but is intended to effect a permanent cure, otherwise it is difficult or impossible to get the average patient to take the rigid care which is necessary.

With the exception of the use of various drugs there does not seem to be much difference of opinion about the general treatment of such cases, though the necessity for keeping the patient warm is often not insisted on as it ought to be.

When we come to the consideration of the local treatment, we find more or less difference of opinion, and it is not necessary to go over in detail what this one and that one has written on the subject, for they may all be classified. Opinions about local treatment may be divided at present among those who do nothing and will hear of nothing being done; among those who advocate the use of stem pessaries; among those who recommend dilatation, either slight or great, with or without curetting; and among those who advise lateral or posterior division of the cervix. To this number of methods the writer adds two: posterior division of the cervix with stitching; Dudley's operation and the use of the constant current, after Apostoli's method.

(*a*) Those who will do nothing, and a sub-class, those who very seldom will advise anything, in all probability base their opinion on the very poor results that have come under their notice, either in their own practises or in those of others. This class appears to be a large one.

(*b*) The stem pessary has had its day in

the treatment of flexions. It is unscientific, and, what is much worse, it can only relieve, seldom cures, and may do harm.

(*c*) Dilatation requires more consideration; it consists of two kinds — slight and great. The first has its advantages in certain cases. It is suitable in the case of married women, when the flexion is not great. In such circumstances it is used in the hope that by distending the canal impregnation may take place, for if the patient becomes pregnant, the dysmenorrhea is cured. Its purpose is simple, and an anesthetic is not required; it seems to be entirely devoid of danger, and the patient does not require to stay in bed. When impregnation does not occur, the good effect passes off very quickly. This line of treatment is useless when the flexion is very acute; for the unmarried it is also impossible, or, at least, very painful without an anesthetic.

Overdilatation has also its merits. It may be done with tents or the rapid forcible method. The action is not the same; with the tents it is simply a distention of the canal; by the rapid method there is, in addition, more or less tearing of the tissues when the operation is pushed to its fullest extent. Dilatation by means of tents is simply the before mentioned slight dilatation carried a step farther, and under similar circumstances may be admissible.

The advocates of the rapid method claim that it is suitable in all cases, whether the patient be married or not. If it cured or greatly relieved the majority of cases at the first operation, this treatment could have much said in its favor, for it is easy in its performance, and is, so far as the writer has seen, harmless, if the late Professor Spence's saying be remembered, that to pass a bougie through a urethral stricture what was most wanted were patience and sweet oil, though nowadays it would have to be something more than sweet. Many patients are not cured unless, of course, they become pregnant, and the writer has heard a strong advocate of the method say that we must go on dilating until we get a cure. This necessity for repetition is a fatal objection, if by any other method even as great a proportion of cases can be cured by one single operation. With reference to this form of dilatation, there is one thing that must be borne in mind — it is that when the stretching is done it must be done thoroughly. Hegar's dilators, or some similar instruments, are as a rule employed in this country, and they do very well, though sometimes, when the tissues are very hard, a double bladed dilator does better. Whatever instrument is used, the stretching ought to be carried out while the uterus is fixed by tenaculum in its natural position; not as is taught in some schools, when it is drawn to or outside the vulva.

(*d*) Simpson's lateral and Sims' posterior division of the cervix must have been performed a very great number of times, often with satisfactory results when the patients were married. The object of both operations is to enlarge the uterine canal; the objection to both is that this result is often only temporary. To give much prospect of the canal remaining open, it is necessary to keep a plug (preferably one of glass) in the canal until the wound or wounds have thoroughly healed by granulation, and then to pass a bougie occasionally. The result of this irritation is that the cervix is apt to become hard, and symptoms may arise of as much importance as those the operation was intended to cure. As compared with dilatation these operations have no advantage; they do not do more good and they may do more harm; they are not safer or more easily performed; and the patient requires to be kept in bed for as long a time.

All these different forms of treatment are wanting in certainty; dilating, division, etc., may result in complete failure; there may be improvement neither in the symptoms nor in the local condition; and it is thus not to be wondered at that many able practitioners are opposed to local treatment. The logical position they have taken up in the past is strongly assailed by Dr. Dudley's modification of Sims' operation of backward division. Indeed, the modification makes such a great difference that it is practically a new operation. What is aimed at may briefly be described as the straightening of the uterine canal, and the healing of the cut surfaces by first intention, so that there will be no hard tissue, or possibility of the old bend returning. The operation was described by Dr. George Keith two years ago for the first time in England. The most essential part of the operation is the accurate stitching together of each half of the wound made when the cervix is divided. Performed with the uterus in its natural position, with the help of a Sims' speculum three-quarters of an inch across, it is not necessary to rupture an ordinary hymen, but it is not an operation to be undertaken by those who either have not the dexterity or have not had sufficient practise

to permit them to do it without drawing the cervix to the outside. Frequently, in bad cases, there is more or less tenderness and swelling in the pelvis, and the result of dragging down a uterus when the pelvis is in such a condition can be easily imagined. By this operation nothing is left to chance, and unless the cuts no not heal the cervix remains permanently in the position and of the shape it is left at the time of the operation. So far as he knows, all the cases he has operated on have been cured or have been improved, not only as regards the monthly pain, but as regards the general health the gain has been well marked. Naturally the early cases have not done so well, on the whole, as the later.

The more the body of the uterus is anteverted, the less perfect is the result likely to be, and special care must be taken in such cases to split as far back as possible. Freedom from pain does not always result immediately, and the greater the anteversion the slower is the complete return to health on account of the old standing congestion of the uterine body. In a few cases the writer has had recourse to electricity to complete the cure. This operation is specially suitable for all unmarried women, and for all married, except those who are afraid of becoming pregnant, as it frequently cures sterility as well as dysmenorrhea. Some there are who will have nothing of the nature of an operation, and for them Apostoli's treatment will give relief.

THE TREATMENT OF BRONCHIECTASIS.

ARNOLD CHAPLIN in *Treatment* of November 11, 1897, tells us that in the treatment of bronchiectasis a drug is needed which, while it is strongly antiseptic, must at the same time be pungent and acrid enough to induce violent expulsive efforts. The dilated tubes once being emptied can be kept in that state by repeated recourse to the treatment. A substance which answers these conditions is the common commercial coal-tar creosote. It is antiseptic, acrid, and penetrating, and easily gives off fumes on heating. Three years ago the writer began the use of this substance, and after giving it a thorough trial became convinced that it offered many advantages over other forms of treatment.

In order to obtain success with this method the details must be carefully studied, as in that lies the secret of relief. The mode of application is as follows: A room about seven feet square by seven feet high must be obtained, and this must be rendered tolerably air-tight. It is well to have the room on the top of the house, or away from it, as there will be less chance of the vapors generated from the creosote causing annoyance to those living in the house. In the center of this room a small stand about one and a half feet high is placed, and on this an ordinary spirit lamp, which admits of being raised or lowered. Over the spirit lamp, on a tripod, an enameled tin dish is placed, and into this is poured about half a pint of the coal-tar creosote. The creosote is heated until the dense, pungent fumes are given off. The patient, clothed in an old dressing-gown, is placed in the room as soon as the lamp is lighted. As soon as the fumes begin to come off, an urgent desire to cough comes on, and soon the cough becomes more or less incessant, and attended with the expulsion of large quantities of phlegm. After the sitting has lasted from half to one hour the patient may leave the room, and wait until the next day before taking another sitting. This should go on steadily from day to day for two months. For the first day or two not much benefit will be noticed, but very soon the expectoration becomes less and the odor less disgusting, and before very long the patient, who before was unbearable, is able to mix with his friends, and, unless he has a fit of coughing, his breath is quite free from smell.

When the writer first tried this treatment he believed that after undergoing two months of it the patient was practically cured, but subsequent investigation has convinced him that he must take a sitting at least three times a week if he will keep his expectoration free from odor. With the cessation of the fetor comes increased appetite and strength. After three years' experience of this treatment the writer has not hesitated in saying that it is superior to all others in his hands, and that although it may not cure, yet it certainly keeps the disease well under control, and opens up to the patient the certainty of enjoying health, strength, and social intercourse, to which before he was a complete stranger. All his cases, with but few exceptions, have been adults. Children do not bear the treatment well, and the benefit to them is not nearly so marked.

A few words may be said about the disadvantages of this method. In the first place the treatment is an unpleasant one, and it requires all the persuasive powers of the physician to keep the patient up to the necessity of going on with the application of the drug;

but after a few sittings patients generally become used to it. Secondly, the fumes of the creosote produce running and smarting of the eyes and nose; but this can be prevented by introducing two plugs of cotton-wool into the nostrils and covering the eyes with a pair of glasses rimmed round with india-rubber. Beyond these there are no drawbacks to the treatment, and it can confidently be recommended as likely to improve the condition of the patient if persevered in for sufficient length of time.

THE ANTITOXIN TREATMENT OF DIPHTHERIA.

In the *Western Medical Review* of December 15, 1897, M. D. JONES concludes a paper on this subject by asserting that the value of antitoxin in diphtheria is no longer a question of opinion or theory, but an established fact. The few who oppose it have proved nothing in comparison with the enormous mass of evidence as to its specific value. It may, therefore, be affirmed that the following facts have been demonstrated:

1. That diphtheria antitoxin, where generally employed, has reduced the mortality from diphtheria at least one-half.

2. That it has distinctly favorable effects on the clinical course of the disease, shortening it and lessening its severity.

3. That the earlier the treatment is commenced the better the results obtained; the mortality, when adequate doses of antitoxin have been given within the first forty-eight hours of the disease, not exceeding five per cent.

4. That antitoxin is a specific against true diphtheria, and less efficacious in mixed infection, but even in these forms of diphtheria it is of decided benefit.

5. That it is not necessary to wait for a confirmatory bacteriological diagnosis, but that in every clinically suspicious case of membranous angina, especially in children, a medium dose of antitoxin should immediately be given, and repeated if required by the further development of the case.

6. That antitoxin is a remedy without serious after-effects in the doses which have ordinarily been employed; that it has no injurious action on the kidneys, the heart, or the nervous system; that it does not entirely prevent albuminuria, heart failure, and post-diphtheritic paralysis, because the effects of the diphtheritic toxin which has already entered the system before the administration of the remedy, no matter how soon the treatment is begun, are not always completely counteracted by the antitoxin.

7. That the protection conferred by immunizing doses of antitoxin is almost absolute for a short period of time.

8. Antitoxin should begin in early or mild cases in not less than 500-unit doses; for moderately severe or recent laryngeal cases in not less than 1000-unit doses; and in severe faucial or larnygeal cases in not less than 1500 unit doses.

If, in the face of the volume of statistics and testimony in favor of the antitoxin treatment of diphtheria, the writer hears a physician oppose or condemn it, he concludes that he either knows nothing about its use practically, or his experience has been very limited and with an inferior product; or perhaps he has treated the case until all other means have failed—hopeless degeneration of important organs has taken place—when as a last resort he expects antitoxin to accomplish the impossible. Under these circumstances the remedy is not employed scientifically or honestly, and should reflect discredit upon the physician and not the remedy.

In the late administration of antitoxin we merely stop the storm waged against the frail bark of life, as irreparable degeneration has taken place, and it sinks beneath the silent wave of toxemia.

SALICYLATE OF METHYL IN ARTICULAR RHEUMATISM.

SIREDEY (*Journal de Médecine*, Aug. 25, 1897), who has made extensive study of the use of salicylate of methyl, gives some particular indications as to its use. He first remarks that salicylate of methyl is not to be confounded with essence of wintergreen, as is not infrequently done. This latter product is much less pure and has not the same active property as the former, besides having a most unpleasant odor and being more irritating to the skin. The method of application is simple. The part having been washed is laid upon a sheet of gutta-percha tissue. The salicylate is now applied directly on to the skin over the affected joint, drop by drop, and the gutta-percha tissue is immediately brought over so as to completely envelop the affected part. A flannel bandage is then applied in the ordinary way. A thin layer of cotton-wool may be used in some cases if the patient does not find it disagreeable or hot. Should it be the hand or foot,

the part can of course be completely enveloped as described. It does not seem absolutely necessary, according to the author, to apply salicylate of methyl directly to the part affected, for, as in the case of the hip where the process of wrapping up to prevent evaporation would be difficult, it seems sufficient to apply it to the thigh immediately below, for the action of the drug is due to its absorption rather than to a merely local effect. The salicylate dressing may be renewed twice in the twenty-four hours if the pains are very severe, and the quantity applied may vary from 50 to 120 drops according to circumstances. It does not seem to produce any unpleasant effect on the skin, merely a slight degree of redness being observed, which is painless and without irritation.

In the case of acute polyarticular rheumatism the author finds the application of salicylate of methyl, as above described, to be well-nigh impossible. Under these circumstances he administers it internally in large doses. But in subacute and chronic cases where fewer joints are affected, and these distally, salicylate of methyl seems to have extremely satisfactory results, being much more marked than those of salicylate of soda. The pains disappeared in two or three hours after the first application, and the author finds that cases which do not respond to this latter are at once relieved by the methyl.

The existence of heart complications seems to be no contraindication; thus the author has applied it in two cases of severe pericarditis, both of which terminated favorably. The same treatment is recommended for gouty arthritis. In the case of infective arthritis the result was not so good, but in large doses a certain degree of benefit was obtained. It would seem that conditions other than rheumatic are controlled by salicylate of methyl. Thus the lightning pains of tabes, tubercular leprosy, Pott's disease, etc., have in the author's hands been much relieved by the application of this drug.—*British Medical Journal*, Nov. 13, 1897.

IODIDE OF POTASSIUM IN PHTHISIS.

H. J. VETLESEN (*Norsk Mag. f. Lægevidensk.*, No. 10, October, 1897), following the recommendation of Sticker, has employed iodide of potassium in small doses in the diagnosis of the early stages of pulmonary tuberculosis. In the twenty-seven cases in which it was used it gave a positive reaction in eight and a negative in nineteen. In these eight cases the administration of the iodide (half an ounce of a 1½-per-cent. solution thrice daily) was followed in from two to three days by the appearance of cough, or by its exaggeration if already present, by the production or increase of expectoration, and by the detection of râles in those parts of the lungs where previously there had been only slight changes in respiration and a little marked lowering of the percussion note. The râle was found to be almost photographically limited to the suspected area, and did not extend beyond it. In only four of these cases was the bacillus of tubercle found in the expectoration, but in the other three the diagnosis of tubercle was facilitated by the existence of other symptoms—swollen glands in the neck, tuberculous disease of the tibia, etc. In the nineteen cases in which the iodide gave no reaction, Vetlesen believes it proven that there was no tuberculosis; and this belief was strengthened by the fact that several of these cases were also tested by the injection of tuberculin, and gave no reaction. The author has kept the patients within his knowledge for two years, and none of them have developed tuberculosis. The conclusion is that iodide of potassium in small doses is an important auxiliary in the diagnosis of the nature and exact position of apical phthisis, especially for practitioners who are not always able to resort to bacteriological examination of the sputum.—*British Medical Journal*, Nov. 13, 1897.

SOME POINTS IN THE MANAGEMENT OF ABORTION.

In *Treatment* of November 11, 1897, ARNOLD LEA after some general remarks on this subject says if, in any case, a diagnosis of threatened abortion is made, how should the patient be treated? In the first place absolute rest in bed, and the use of the bedpan for micturition and defecation, should be insisted upon. The administration of a dose of castor oil, or a simple enema, is often required. With regard to treatment by drugs, if hemorrhage is a marked symptom small doses of the fluid extract of ergot, twenty to thirty minims every four hours, should be given, with the object of contracting the uterine vessels, and thus checking further separation of the decidua. This may be combined with small doses of opium.

If pain, the result of uterine contractions,

is the principal symptom, a full dose of tincture of opium—thirty minims or more—should be given. Occasionally this seems to act better if given by enema. It may be repeated every two or three hours if necessary. The fluid extract of viburnum prunifolium in thirty-minim doses has also a powerful effect as a uterine sedative, though in some cases it appears to fail completely. It may be given three or four times a day, combined preferably with opium.

This treatment should be continued for several days after the symptoms have apparently subsided. We often, however, meet with cases in which abortion is in progress, or our attempts at checking it have failed. We find the os uteri partially dilated, with the pains strong and recurring regularly. If hemorrhage is moderate in amount no interference is advisable. We must always bear in mind that any manipulation undoubtedly increases to a great extent the risk to the patient, however carefully carried out; and though at times it is necessary, we must always keep clearly before us the serious nature of our proceeding. If hemorrhage is free, and the uterus appears to require stimulation, we may administer ergot in considerable doses—one drachm of the extract every four hours—and we may further introduce into the vagina through a duck-bill speculum a tampon of lint soaked in perchloride (1:3000). This should be firmly packed into the posterior fornix. It often brings about the expulsion of the uterine contents in a few hours, though it should not be used in cases after three and a half to four months.

If these mild measures fail to procure complete expulsion of the uterine contents, we must proceed further. It is probable that sixty to seventy per cent. of abortions terminate naturally without any interference, but in practise we are more often called in to the exceptional cases; still in a large number the use of the above treatment is all that is needed.

It is important to appreciate the condition of the uterine contents at the various periods of pregnancy. Thus, at the end of four to six weeks, the decidua forms the bulk of the uterine contents, which at this time do not entirely fill the uterine cavity. At this period the natural efforts usually suffice to expel the ovum and decidua entirely.

At two months the embryo is much larger, and the decidua vera is thinner and more apt to remain behind after the chorion ruptures and the embryo escapes.

At the end of ten to twelve weeks the placenta is clearly differentiated, and the decidua has, to a great extent, atrophied. Inasmuch as the degenerative changes, which normally occur towards the end of pregnancy, have not taken place, adhesion of the whole or part of the placenta often arises. It is important also to note that occasionally the fetus is expelled, surrounded only by the unruptured amnion, the whole of the chorion and placenta being retained. The writer has observed two cases in which this occurred, and Haultain has recently recorded three instances in his own practise.

If, then, the contents of the uterus are incompletely expelled by the natural efforts within twenty-four hours, several conditions may arise:

Hemorrhage may be profuse. No time should be lost in evacuating the uterus. For this purpose the finger carefully asepticized is the most reliable instrument. If this is insufficient, it may be supplemented by the use of a blunt curette to detach specially adherent fragments. If necessary the cervix must be dilated by Hegar's or Duncan's dilators, and an anesthetic may be required.

There may be no hemorrhage, and within three or four days the contents of the uterus are expelled. To facilitate this ergot may be given. Schwabe has lately insisted on the powerful effect of quinine given in ten-grain doses twice a day. This should always be tried along with aseptic treatment of the vagina and vulva.

Recurrent hemorrhage may be set up. If the above remedies do not cause expulsion of the uterine contents, digital removal, as above described, is indicated.

Hemorrhage may entirely cease for a week or longer; then on some slight exertion, severe flooding occurs. This may continue for weeks at intervals. In these cases a piece of decidua or placenta has become vascular, forming perhaps a small polypus. If neglected this condition may result in grave anemia, though fatal hemorrhage is very rare. The only treatment is exploration of the uterus and removal of the fragment digitally or by the blunt curette.

Decidual endometritis may follow the retention of small fragments of decidua. The uterus remains bulky, and severe hemorrhage occurs at the succeeding menstrual periods. This is best treated by dilatation of the cervix and curetting followed by the application of linimentum iodi, or a solution of carbolic acid in alcohol (twenty-per-cent.).

In very rare cases malignant degeneration of the decidua has followed abortion. This is characterized by irregular hemorrhages, profuse and offensive discharges, with enlargement of the uterus. This is soon followed by fixation of the uterus and metastatic growths in various organs. The only treatment is early extirpation of the uterus *per vaginam*.

In addition to the foregoing, the element of sepsis may at any time be introduced in a case of incomplete abortion. This may be the result of autoinfection from the vagina, especially if some fragments of decidua or clot are hanging out of the cervix, thus forming a suitable medium for organisms to develop; exceptionally it may be due to preexisting uterine or periuterine inflammation, such as a pyosalpinx or pelvic abscess. Lastly, organisms may be introduced from outside by the finger or instruments. If any signs of infection are manifest, such as offensive lochia, pyrexia, etc., no time must be lost in exploring and emptying the uterus. The sepsis is usually mild in the first place and readily curable by energetic measures. If, however, there is delay the organisms may enter the blood-vessels and lymphatics of the uterus, producing general septicemia, which may terminate fatally, or result in chronic inflammation of the uterus and appendages.

It is important in treating these cases to avoid the use of the sharp curette, as there is great danger of opening up the sinuses and thus facilitating the march of the infection. The finger or a blunt curette should be used, and a strong antiseptic then applied freely to the uterine cavity.

HOW TO TREAT SICK-HEADACHE.

Analgesine, says Dr. Hirtz in the *Journal des Praticiens* of December 11, 1897, is unquestionably a medicament of the first order. Huchard experimented with it as an antipyretic; but it is especially an analgetic, and Germain Sée used it commonly to combat pain. The dose is, so to speak, individual. Some subjects are relieved by a dose of four grains; others require fifteen grains; and sometimes thirty or forty-five grains are necessary to obtain recovery.

Patients should be warned against the abuse of this drug, which has become public property and is frequently taken without the advice of a physician, as it gives rise occasionally to symptoms of veritable poisoning. Analgesine is more easily tolerated when combined with eight grains of sodium bicarbonate. It may also be administered hypodermically when the condition of nausea dependent upon the headache is too painful and too pronounced to allow of the ingestion of any liquid. It may be given in enemata, from thirty to forty-five grains of analgesine with six drops of laudanum being sufficient for four injections.

Before the employment of analgesine, says the author, caffeine was frequently prescribed, either in potion or in subcutaneous injection, and the following formula by Huchard may be recommended:

℞ Caffeine,
Sodium benzoate, of each 660 grains;
Peppermint water, 8 ounces.
M.

A teaspoonful is to be given every two hours until four teaspoonfuls have been given, each one representing four grains of caffeine. The same dose will be contained in a Pravaz syringe, with the following formula for hypodermic injection:

℞ Caffeine, 38 grains;
Sodium benzoate, 44 grains;
Distilled water, sufficient to make 2½ drachms.
M.

If the sick-headache persists after the administration of analgesine, other drugs may be tried, such as acetanilid. They should not be given except in divided doses, in small capsules containing from three to four grains five or six times a day. Care should be taken not to exceed thirty grains a day.

Phenacetine has the advantage of being almost non-toxic and of provoking much more rarely than analgesine eruptions and symptoms of intolerance. Capsules containing four or five grains may be given four or five times a day.

Exalgine does not give such brilliant results in sick-headache as in the trifacial neuralgias. Four grains may be given at a time, but this dose should not be exceeded, and its action should be carefully watched, as it gives rise to accidents.

Lauder Brunton, says Dr. Hirtz, recommends sodium salicylate combined with potassium bromide. The amount is twenty-three grains of the former and thirty-eight grains of the latter, given in four doses.

Immerwahr, Lewy and Schumann have found in methylene blue a very efficacious remedy for sick-headache, especially the form called angeiospastic. They gave it in doses of a grain and a half four times a day,

combining it with nutmeg as follows, in order to avoid vesical irritation:

℞ Methylene blue,
Pulverized nutmeg, of each 1.5 grains.
M.

This quantity will make one capsule, about four of which may be given a day.

Migrainine, which is considered by Schumann one of the best remedies for sick-headache, is a combination of antipyrin and caffeine as follows:

℞ Antipyrin, 89.4 per cent.;
Caffeine, 8.2 per cent.;
Citric acid, 0.56 per cent.
M.

Aconitine is sometimes successful when other nervines fail. It is prescribed in globules only, each containing four one-thousandths of a grain, of which two a day may be given.

Guarana contains guaranine, which is identical with caffeine. It is given in a powder in doses of from eight to thirty grains dissolved in water.

Seguin, who was a great advocate of the ocular theory of sick-headache, thought it was frequently due to defects of refraction, and he recommended the employment of mydriatics and the correction of the muscular defects by wearing proper glasses. As an internal remedy, he recommended the extract of cannabis indica, to be given three times a day in pills, each containing a fifth of a grain, which amount may be progressively increased to three grains. Gradle, of Chicago, prefers the tincture of cannabis in doses of from twenty to twenty-five drops twice a day, at an interval of six hours.

Ophthalmic sick-headache during its painful stage is amenable to the same treatment as common sick-headache. Other indications, however, present themselves. This form of sick-headache is associated with nervous affections, such as neurasthenia, hysteria, certain mental troubles, epilepsy, tabes, and general paralysis. The most useful treatment, and the only one really efficacious, given in the interval between the attacks in order to delay their recurrence, is with the bromides. Charcot and Fere, says Dr. Hirtz, laid great stress on the services which this treatment rendered. Potassium bromide, sodium bromide, or a mixture of several bromides, may be prescribed in amounts increased from thirty to ninety grains in twenty-four hours.

Ophthalmoplegic sick-headache sometimes resists all treatment. During its painful stage antipyrin, phenacetine, exalgine, etc., may be employed. The paralytic stage is frequently rebellious to all therapeutic intervention, and this is explained, says the author, by the anatomical and pathological changes. In one case Gubler found the oculo-motor nerve surrounded by an abundant exudation, with thickening of the pia mater. In a case coming under Weiss's observation the nerve was buried in tuberculous masses; in another the nerve was pressed upon by a fibro-chondromatous tumor. In spite of these facts, which baffle all attempts at cure, either the iodide or the bromide treatment should always be tried. Locally, energetic revulsives may be tried under the form of blisters, the cautery, or even the seton. Not only must the attacks be cured, but, what is more difficult to accomplish, their recurrence must be delayed, in order to render them less frequent, and, if possible, to cause their disappearance. To do this, the various causes which lead to sick-headache should be taken into consideration. The patient should be put upon a strict diet; he should avoid all indigestible food, alcoholic drinks, and liquors, the smallest doses of which bring on an attack of sick-headache in predisposed subjects. The majority of recoveries, according to Dr. Hirtz, are due to extreme sobriety.

Debout recommended the following as a prophylactic measure:

℞ Quinine sulphate, 45 grains;
Pulverized digitalis flowers, 23 grains;
Syrup, a sufficient quantity.
M.

This quantity will make thirty pills. The dose is a pill every night for a period of several months.

In arthritic, rheumatic and gouty persons, the following treatment is recommended by the author: The patient is put upon a strict diet; nitrogenous or indigestible food, especially vegetable, is not allowed at night, and water or a drink like weak tea may be taken. In the morning, before eating, Carlsbad or Tarasp water, heated to about 104° F., may be taken, or else Vichy water. Every night, before supper, a pill containing the following mixture may be taken:

℞ Quinine valerianate, 15 grains;
Extract of colchicum, from 3 to 7 grains;
Extract of digitalis, 3 grains;
Extract of aconite, 1½ grains.
M.

This quantity makes ten pills.

Neurasthenic sick-headache is best benefited by living in the country, moderate

muscular exercise, and a quiet life free from professional occupations. It may be overcome by the employment of the phosphates or the glycerophosphates, the use of which may be alternated with arsenic under the form of Fowler's or Pearson's solution, in amounts of from six to twelve drops a day; or strychnine arsenate may be used in globules containing fifteen one-thousandths of a grain, of which from two to three a day may be given.

Hydrotherapy, static electricity and psychotherapy are, says Dr. Hirtz, ordinarily valuable adjuvants.

THERAPEUTIC PROGRESS IN 1897.

Under this heading the London *Lancet* of December 25, 1897, points out editorially that although the publications connected with the treatment of disease have, as usual, been very numerous during the past year, interest continues to center round the different applications of various forms of serum treatment. The record of cases of diphtheria treated with antitoxic serum has fallen, or at least the number of publications is less than in the previous year, but this appears to be due to the more general acceptance of antitoxin. The cases which are published include a series of triumphs and, as usual when the majority are agreed upon any given point, there is less room for debate and less need for the record of experiences. More recently greater attention appears to have been directed to the use of tetanus antitoxin, and in spite of the value of experimental work it must be admitted that the clinical results have been frequently disappointing. Side by side with these investigations much valuable work has been done in connection with many of the older remedies.

The list of new drugs to be enumerated is this year comparatively small, and even in this list, with one or two exceptions, the novelties do not seem to be of any great importance. Questions connected with therapeutics have been freely discussed, and the best indication of the tendency of the view of modern physicians was perhaps afforded by the debate on the treatment of insomnia at Montreal. We have in these pages long protested against the continuous administration of hypnotics, and from time to time have sounded a warning note of the dangers connected with many of the newer hypnotics. Hence, we are entirely in accord with the discussion at Montreal, since it showed that most of the speakers were far from being content with the routine employment of any particular drug. The discussion in many ways served to indicate the limits of utility of different hypnotics, such as sulphonal, paraldehyde, urethane, and the like. Some of the speakers mentioned comparatively new remedies, such as pellotin, trional, and chloralamide, but the whole tendency of the discussion indicated that the causes of insomnia, rather than new remedies, should be sought for.

Perhaps the greatest amount of literature in connection with new remedies deals with the search for a satisfactory local anesthetic. It is not so many years since cocaine was introduced with such extremely laudatory notices that it was perhaps somewhat too indiscriminately used and soon claimed a fairly large percentage of undesirable effects. Most of these effects were absent, or at least were thought to be absent, with eucaine, a remedy which was fairly largely employed in 1895 and 1896. From the first some patients complained bitterly of the smarting or burning pain which resulted from the local application of eucaine, and, although the subsequent anesthesia was sufficiently satisfactory, it was felt that it had been rather dearly purchased. It is perhaps yet too early to determine the future position of eucaine in medicine, but nearly all the published accounts during the year have shown dissatisfaction with the drug, even although its anesthetic powers are fully recognized. On the other hand, in its favor it may be stated that it appears to produce toxic symptoms comparatively rarely and that the toxic dose is greater than that of cocaine. Another local anesthetic — which in composition is said to be closely allied to phenacetine—is holocaine. This also causes some transient sense of burning when applied to the conjunctiva, but it has been claimed for this drug that it has no effect on the pupil, on accommodation, or on the blood-vessels. Inasmuch as this drug has only very recently been employed, the published accounts so far are purely laudatory. Orthoform and anesin are two other local anesthetics of recent introduction, of which, however, very little is yet known. Some interesting experiments have been made with the view of determining the activity and purity of cannabinol, which seems to produce symptoms practically identical with those of Indian hemp; while further experiments have been made with mescal, which obviously possesses a some-

what dangerous power of producing subjective visionary sensations. The accounts of the effects produced by this drug written by Dr. Weir Mitchell and Mr. Havelock Ellis will probably be read as interesting contributions to medical literature, even though they do not pretend to have any therapeutic application.

The position of quinine in medicine appears to be established on such a firm basis that it is rather a shock to find recommendations of substitutes for it. The claims of the substitutes are invariably that they produce less giddiness and tinnitus, while they are credited with similar powers of lowering the temperature. Euchinine has been recommended on these grounds, and from many accounts it appears to have given satisfaction both as an antipyretic and antineuralgic. It shares with quinine the disadvantage of extreme insolubility. Another antineuralgic or antipyretic is a glucoside named kolanine, derived from the kola nut. Other antipyretics which have been described are kryofin and pyramidon. The former is said to be at least as useful as phenacetine or antipyrin, but like these it is not free from the charge of occasionally producing undesirable effects. Pyramidon has been used in typhoid fever and also in some cases of locomotor ataxia. In spite of the introduction of two new antipyretics there can be no doubt that the older methods of cold sponging and baths still remain in favor.

The group of antiseptics has not been materially enlarged. The older remedies are still found efficient and free from objection. Acetanilid has, however, been recommended for local application, while chinosol and airol have also been used as antiseptics. Juniper tar oil, or oil of cade, was not long since recommended as a disinfectant in cholera; careful and extended research has, however, demonstrated that it has relatively weak powers. It has been suggested that in the local treatment of rheumatism oil of wintergreen is preferable to salicylate of sodium, and apart from the greater rapidity of action obtained from the former drug it is said to be free from the liability to produce tinnitus.

Several valuable papers have been published in connection with the treatment of the cardio-vascular system. Foremost amongst these stands an interesting account by Dr. C. R. Marshall of the antagonistic action of digitalis and the members of the nitrite group. In this he furnishes a very useful summary of the actions of digitalis, and from the experimental side appears to have shown that there is an antagonistic effect on the muscle cells when these substances are used in combination. Further experiments have also been made with digitoxin, which, however, appears to be almost too active for safety. Erythrol tetranitrate, which was introduced by Dr. Bradbury in his Bradshaw Lecture, has in some cases given satisfaction in procuring relief of asthmatic attacks and also of cardiac pain. Pilocarpine has been used for the relief of excessive sweating, although it generally acts as a diaphoretic. Much of a contradictory nature has been written of its value in the treatment of puerperal eclampsia. Many observers maintain that it is a dangerous drug, since it provokes excessive bronchial secretion. It has been suggested that this might be counteracted by the simultaneous employment of atropine.

Creosote, which was formerly much used in the treatment of phthisis, has gradually lost favor owing to its effects upon the stomach and intestines; these discomforts are said to be avoided by the employment of creosotal, which reduces the bronchial secretion, cough, and night sweats. Hydrastis canadensis has been employed in cases of early phthisis and has been found to be an efficient expectorant, while satisfactory results in the treatment of whooping-cough have been claimed for both naphthalene and resorcin. In the paper by Dr. Marshall referred to above the diuretic influence of digitalis was considered. It is somewhat curious to find that strophanthus has lately been recommended as a diuretic, and it is stated that it possesses greater rapidity of action and more powerful diuretic effect, while it is free from the disadvantage of cumulative action or of producing digestive disturbance. The discussion upon diuretics at Montreal was prefaced by two admirable papers which dealt respectively with the clinical and pharmacological aspects and left but little scope for subsequent debate. At the same meeting the diuretic action of *Apocynum cannabinum*, the Canadian hemp, was favorably considered, although it was admitted that it might produce violent emesis and catharsis. These undesirable results were, however, attributed to the admixture of the bitter fiber of the wood with the bark of the root. Salicylate of sodium and caffeine have also been employed for their action on the kidney; the former has been found to check the diuretic action induced by the latter. Small doses of cantharides have been recommended

in acute infectious nephritis, though they are contraindicated in cases of interstitial nephritis. Uremic dyspnea has been treated with ether administered by the mouth and subcutaneously, but it seems only to be of service in cases associated with much pulmonary engorgement. As a laxative for the treatment of chronic constipation in children olive oil has long held a certain degree of favor in domestic medicine; recently, however, it has been urged that it should be employed with a free hand in typhoid fever. Rectal injections of a quarter to half a pint are, if necessary, supplemented by a large breakfast-cupful given by the mouth, and the results claimed for this treatment appear to merit further investigation.

Early in the year we published an account of the treatment of dysentery with *Monsonia ovata*, which is said to exert a specific action distinct from mere astringency. Taka-diastase has been recommended in our columns for some forms of indigestion, and chinaphthol is said to escape change within the stomach and to split up into its constituents in the intestine, where it is credited with local action. Of the list of drugs which have been used in affections of the skin permanganate of potassium in the treatment of lupus, thyroid extract in prurigo, and hypodermic injections of thiosinamine in keloid deserve mention. Tuberculous peritonitis is said to have yielded to the use of creosote in the form of enemata, while injections of glycerin and iodoform into the synovial cavity of the knee-joint are believed to have produced satisfactory results in tuberculous disease of the knee. Thyroid extract has been used with apparent benefit in a large number of different diseases, many of which are devoid of definite pathology. The treatment of syphilis was discussed at some length at the Montreal meeting and allowed scope for detailed remarks on the relative value of different preparations of mercury.

ANESTHETICS.

The London *Lancet* of December 25, 1897, after drawing attention to the fact that the year which has just come to a close is the fiftieth anniversary of the introduction of chloroform as an anesthetic, reminds us that the occasion was duly honored by the Society of Anesthetists with a *conversazione* at which an interesting oration on the progress of our knowledge of anesthetics was delivered by the President, Dr. Dudley Buxton. Professor Simpson gave an address in Edinburgh in commemoration of the first use of chloroform in midwifery by Sir James Y. Simpson. In Tokyo, also, the jubilee of anesthetics was marked by a special meeting and an address by S. Sato, while Ishiguro spoke of the history of the uses of anesthetics in Japan.

Many valuable voluminous papers on anesthetics have appeared during the year, notably one in which Hill carried further his research published in 1897 in the *Journal of Physiology* for May, p. 323. He pointed out that the circulation of the blood depends upon the vasomotor mechanism being intact. The abdominal wall is able to support the veins and so prevents their distention under the hydrostatic pressure of gravity. Muscular contraction during expiration compresses the hepatic and other veins helping to fill the right heart. When the vasomotor tonus is maintained the splanchnic area abrogates the effects of gravity. In vasomotor paralysis gravity at once causes accumulation of blood in the abdominal vessels. This leads to anemia of the brain and the respiratory center is driven to greater activity. Powerful muscular movements take place and blood again enters the right heart. Contraction of the abdominal muscles limits the outflow from the splanchnic vessels. When both the vasomotor tonus and the respiratory pump are paralyzed the circulation cannot be maintained in the "feet-down" position. Chloroform paralyzes both these factors of the circulation. No amount of compression of the abdominal veins will produce paralytic distention of the heart. Both chloroform and asphyxia will do so. Hill finds that such a condition is at once relieved by dropping the patient into the "feet-down" position, as the blood at once flows from the right heart by the force of gravity. The teaching of physiology thus has a practical value and tells us that vasomotor paralysis is a danger to be looked for and provided against as well as the always accepted danger from respiratory paralysis—a condition which Hill finds may arise both from anemia of the brain centers as well as from accumulation of the drug. In the former case the failure of respiration is secondary to the primary cardiac failure.

Wood and Carter undertook a research upon somewhat similar lines and came to rather different conclusions. The fall of arterial pressure, unless very profound, they think does not affect the respiratory center. They admit that if the fall is extreme the respiration will fail, but not otherwise. At

first excessive fall of pressure stimulates the vasomotor center. The circulation recovers itself more slowly after ether than after chloroform. Ether as well as chloroform may cause death some hours after the administration has been discontinued and even after consciousness is present. They regard the effect of chloroform as being more a drug effect than the result of vasomotor influence; and they further think that the after-depression of ether is more severe than that of chloroform. It seems probable, however, that these findings are the result of a fallacy, for they worked with excessive doses of ether when compared with those of chloroform. Hare contends that chloroform kills by vasomotor paralysis. He advocates the use of atropine, bandaging the extremities, compression of the abdomen, and inversion in the event of syncope. Schleich, if we are to accept the evidence of Maduro, has suggested a new and valuable method. His theory is that the anesthetic should have a boiling point as near the body temperature as possible. He has accordingly made three mixtures which have boiling points respectively of 38° C., 40° C., and 42° C., by combining chloroform, ether, and petroleum ether (benzine) The first mixture when inhaled causes a light and transient sleep, the second and third greater and greater depths of anesthesia. The patients are said to be spared all or most of the after-effects of narcosis. No doubt so careful an observer as Schleich has made sure of his ground before he has allowed publication. Meyer (New York) also has employed the method of Schleich for general anesthesia and speaks of its value. It obviates cyanosis, bronchial troubles, and, it is said, does not affect the heart as much as chloroform.

An attempt has been made to trace a causal relation between the temperature, the dampness of the atmosphere, and the death-rate under anesthetics, but it must be confessed that the views enunciated are more theory than proved fact. The subject of anesthetics in obstetric practise has received considerable attention, several papers having been read. Ballantyne draws attention to the fact that the physiological condition of parturition is one marked by hypertrophy of the heart, while the constant contraction of the abdominal and other muscles during labor helps to maintain the circulation. Blood-pressure is thus kept up and even increased, and the respiration is excited. The results of Doenkoff working with Schatz's tokodynamometer show that although deep chloroformization does lessen the uterine contractions, ordinary narcosis has no effect whatever in that way.

Waller has carried further his important research work commenced some time back, and dealing with the behavior of a detached nerve when exposed to the vapors of various anesthetics. Prolonged series of action-currents caused by tetanization at regular intervals exhibit no diminution—*i.e.*, nerve is practically inexhaustible. When the nerve is exposed to the anesthetics, ether or chloroform, the active currents are temporarily suppressed—*i.e.*, the anesthetics temporarily abolish excitability. Chloroform causes more prolonged suppression than ether, and the suppression is finally absolute—*i.e.*, no recovery takes place. Waller has come to the conclusion that the relation of safety of these two anesthetics is as one to seven—*i.e.*, chloroform is seven times more deadly to nerve-tissue than is ether. The clinical evidence upon this point is usually taken to show that for every one death under ether thirteen under chloroform take place. There seems no reason, however, to regard these figures as necessarily discrepancies, since in the first place the clinical statistics are far from being exact, while there must be obvious differences between the behavior of detached nerve and the nervous system as a whole. Waller's conclusions led him to what he regards as "the chloroform paradox." If, he says, chloroform is a dangerous agent it should only be used in exceptional cases, but if it is as safe as ether, which he denies, any deaths which take place under it ought not to occur, and the persons who are responsible for them must be held to be guilty of culpable carelessness. Waller further examined other bodies with regard to their action upon nerve: Four-per-cent. carbon dioxide increased nerve excitability; in larger quantity it caused its diminution or abolition followed by augmentation—*i.e.*, it behaves like ether. Oxygen, nitrogen, hydrogen, nitrous oxide and carbon monoxide have no effect upon the nerve currents. In reference to the action of carbon dioxide Waller points out that the danger of asphyxial states during the giving of chloroform lies not in the presence of an accumulation of carbon dioxide, but in the accumulation of the chloroform itself.

L. Guthrie, reviewing the subject of "Chloroform Narcosis in Children," finds that children, as far as his experience goes, are affected in precisely the same way as adults and are

therefore quite as liable to the accidents associated with chloroform. Deaths of very young children are perhaps less common than is the case with adults, but it is so simply because children are more easily brought round after overdosage than adults. Their chest-walls are more resilient and their hearts are not as a rule affected by fatty or other degeneration, and hence they respond more effectually to artificial respiration. He gives his experience upon various points. He has never succeeded in chloroforming a sleeping child without awakening it—an important point in medico-legal practise and one illustrated by a recent case of burglary when several persons were stated to have been successfully chloroformed during sleep by the burglar. The conjunctival reflex is not, Guthrie thinks, reliable as a sign of anesthesia in children. Nor does he accept the eye movements as a guide. A moderately contracted pupil, slowly rolling eyeballs, full, deep, regular, somewhat stertorous respiration, slight congestion of the face and lips, regular slow pulse, and no change of these during the progress of the operation are, he thinks, the only reliable signs upon which it is safe to rely. Guthrie also insists that the degree of anesthesia should be varied, accordingly as the different steps of the operation are more or less likely to produce shock.

At a meeting of the Harveian Society (April 29, 1897) the subject of giving anesthetics to children was dealt with, and several speakers referred to the difficulty of judging when a young child was anesthetized. It was pointed out that this drawback did not exist in the case of ether, and its use for young children was recommended. Pollock and Warrington Haward urged the use of ether for children many years ago, and their experience is confirmed by later workers. The employment of the A. C. E. mixture has again been advanced as a useful method in the case of children, and others advocate it both for adults and children as a means of inducing anesthesia, while that condition is maintained by the inhalation of ether well diluted with air. Clement Lucas drew attention to the possible source of infection arising from patients inhaling anesthetics from a dirty face-piece. He believed that pneumonia occurred from this cause. The challenge thus given was taken up by several anesthetists, who discussed the subject at a meeting of their society in March. It was pointed out that pneumonia was a not uncommon complication of surgical procedure in the days before anesthetics came into use. At the present time such cases were very rare and were probably not traceable to the anesthetic at all. Silk points out that in the years 1894 and 1895, out of 5000 cases published in hospital reports only thirteen cases of pneumonia are noted. All these except one were of septic origin. Prescott, of Boston, had met with three cases of pneumonia out of 40,000 etherizations. Further, both ether and chloroform are destructive to bacillary life. Again, nitrous oxide gas, which is the most commonly given anesthetic, is never the cause of this disease.

With regard to the question of pneumonia following the use of ether, Whitney has found that the pneumonia which occurs is not a peculiar form of the disease; the ordinary pathogenic organisms are present, and the disease follows the normal course. Sternberg holds that pneumococcus is normally found in the mouth. Whitney further suggests that the prolonged use of ether may lower the vitality of the epithelium and enable the organism to exert a specific action. As a prevention he advises that the mouth, nose and pharynx of the patient should all be carefully sterilized before the anesthetic is given.

It is of no small interest to find that two observers, Lemoine and Gallois, have employed ether both internally and hypodermically for the treatment of uremia and nephritis and have met with success. If their results should be confirmed it may prove that the action of ether is after all not so deleterious as has been held by some.

Von Lerber has examined the condition of the blood after ether has been inhaled, with the following results: In 101 cases the blood was examined and the hemoglobin was in the majority of instances unaltered; the corpuscles were found to be but little changed either in number or in appearance, although some leucocytosis was present. Spectroscopic examination of the urine showed no increase of the urobilin. He concludes therefore that ether does not exert any dele erious effect upon the blood.

The statistics of Gurlt for the year are of interest; they comprise 58,769 cases. Of these, 27,029 refer to the use of chloroform with 29 deaths; 19,856 to ether with 3 deaths; 5000 to Billroth's mixture (chloroform, ether, and morphine); 1000 to brom-ethyl; 600 to ether-chloroform with no deaths. The figures for seven years are: 327,500 cases with 134 deaths—*i.e.*, 1 in 2444; and 1 death in 2039 from chloroform.

THE UNTOWARD EFFECTS OF QUININE.

A. LAVERAN in an original article in the *Journal des Praticiens* of October 9, 1897, after pointing out that ordinary doses of quinine are usually well borne, passes on to a consideration of the fact that its salts are irritants to the skin if the epiderm is removed, and that they also prove irritating, in concentrated forms, to the mucous membrane of the digestive canal. So much is this so that Broussais has regarded the sulphate of quinine as sufficiently irritating to produce or augment gastritis present in febrile patients, and he even recommended that the physician resort to the use of bleeding and purgatives for the relief of gastritis produced by the drug. This view of Broussais is, however, excessive, and true gastritis caused by quinine need never be feared. The nervous troubles which are most commonly produced by the drug are, as is well known, roaring in the ears, with vertigo. The drug in large doses or when given to persons with an idiosyncrasy is, of course, undoubtedly poisonous. Thus Trousseau and Pidoux report the following cases:

A young nun took in one day about twenty grains of the sulphate of quinine, and on the following day forty-five grains, for the cure of an attack of asthma. Four hours after the ingestion of the poison she had loud noises in the ears, vertigo, and excessive vomiting, and seven hours after the administration of the quinine total blindness and deafness. After this delirium came on and the case required active treatment, but the patient recovered. (Traité de Thérap., 8 edit., t. ii, p. 487.)

Another instance occurred in a vigorous man, the case being reported by Floyer, in which dyspnea and urticaria followed the administration of a very small dose, amounting to only three grains (*British Medical Journal*, 1886).

Rizu reports a case in which the sulphate of quinine in very small doses provoked congestion of the face, severe attacks of orthopnea, and urticaria (*Bull. de la Soc. des Méd. et Natur. de Jassy*, 1887).

Pispiris, of Athens, has also published two cases of intestinal hemorrhage in anemic malarial patients following the administration of quinine (*Galenos*, Athens, August, 1888).

Kobner has seen grave symptoms arise in a child after the hypodermic injection of five grains of sulphate of quinine, and scarlatiniform eruption take place. There was colic and a bloody discharge from the rectum. (*Bull. Gén. de Thérap.*, 1890, p. 506.)

Grooskopff has also observed grave symptoms after the use of thirty-eight grains of quinine in one dose (*Therap. Monatshefte*, 1892), and a number of instances are on record in which hemoglobinuria has been produced by quinine.

Laveran believes, however, that cases of intolerance to quinine are rarely met with. He himself has never observed, after the administration of sulphate of quinine in the dose of fifteen to forty-five grains in twenty-four hours, anything more than roaring in the ears and fleeting deafness.

On the other hand, Bouchardat (Manuel de Matiere Médicale, Paris, 1865, 3 edit., t. ii, p. 392) mentions a case of a patient suffering from malaria who received from forty-five to sixty grains of quinine, with a fatal result, although the patient was an adult male.

Maillot, in a case of pernicious anemia, administered, on the other hand, more than two and a half drachms of sulphate of quinine in twenty-four hours and cured his patient.

Monneret has given two drachms of sulphate of quinine a day for rebellious headache, with good results; and Giacomini has given, without inconvenience, during a period of over forty-seven days, forty-five grains to a drachm of the sulphate of quinine each day. Giacomini also records the case of a man who by mistake took no less than three drachms of the sulphate of quinine in one day without any other manifestations than great depression of the heart and nervous system. These symptoms were, however, combated with success by the aid of stimulants.

Guersent cites the case of a woman who took no less than ten drachms of the sulphate of quinine in one day. There was temporary loss of vision and hearing and the power of speech. The surface became cold and cadaverous, but the symptoms disappeared rapidly. We also find that Briquet has recorded the case of a physician who for the cure of a mild fever administered the enormous dose of fifty-five drachms of the sulphate of quinine in ten days and finally died as a result of it.

Guinon has reported the case of a neurasthenic adult in whom two drachms of sulphate of quinine were taken with suicidal purpose. This dose failed to produce death, but was followed by profound collapse, insensibility, coldness of the extremities, and cyanosis.

The dominant symptoms beyond those just mentioned were deafness and blindness. The deafness was absolute for several hours, but then disappeared. The blindness was not complete until several hours had elapsed after the ingestion of the poison. At first the pupil reacted to light, but seven to eight hours after the poison had been taken it became immovable. The urine at first was markedly increased, but afterwards was abundantly reestablished under the influence of treatment, which consisted in the subcutaneous injection of salt water, washing out of the bowel, and the abundant administration of coffee. The temperature remained normal; the pulse was good, being 120 on the first day and 100 on the second day. It has also been demonstrated by cases reported by Baills (*Archiv de Méd. Militaire*, 1885, t. vi, p. 320), Rosenbusch (*Wiener Med. Presse*, April 13, 1890) and G. Greswell (*The Lancet*, May 1, 1897) that as much as three drachms of the sulphate of quinine may be taken at once by an adult without producing death.

Laveran then reports the case of two soldiers who took this quantity of the drug. Half an hour after the drug was swallowed the patient suffered from violent cramps in the stomach, with vomiting, pallor of the face, disturbed respiration, dilated pupils, feeble, irregular pulse, and partial insensibility, with loud noises in the ears and a tendency to syncope. In other cases patients have been seen in whom quinine produced restlessness, delirium, vertigo, intoxication as from ordinary drunkenness, vomiting, and great depression of the nervous system. Cases are also mentioned by Laveran in which quinine seemed to produce hemoglobinuria, even when given in small doses, the urine becoming either red or black. This accident has been well studied and described by Tomaselli in Italy and by many Greek physicians, among whom may be mentioned Karamitzas, Theophanidis, Pispiris, Pampoukis, and Chomatianos.

Karamitzas reports an instance which he studied where hemoglobinuria followed the administration of only five grains of sulphate of quinine; and Kanellis, Pampoukis, Chomatianos and Moscato have observed similar instances. The following references may be of interest in connection with these names and in connection with additional information not given in this article:

Tomaselli, *Rivista Clinica di Bologna*, 1878, p. 119; Ughetti, *Lo Sperimentale*, 1878; Karamitzas, *Bull. Gén. de Thérap.*, July 30, 1879; Pampoukis, "Etude sur les Fievres Palustres de Grece," Paris, 1888; Pampoukis et Chomatianos, "Reciul. Clin. et Experim. sur l'Hemoglobinurie Quinique," *Progrès Médical*, 1888; Tomaselli, "Sur l'Intoxication Quinique," Congres de la Soc. Italienne de Med. Int., Rome, Oct. 20, 1888; Spyridon Kanellis, *Arch. de Méd. Nav.*, 1888, p. 476; Pasquale Moscato, *Gazzetta degli Ospitali*, 1890, Nos. 17–19; Hare, THERAPEUTIC GAZETTE, July, 1892; Vaughan, "De la Quinine dans l'Hematurie Malarienne," Assoc. des Med. Americains, 1892; Pasquale Moscato, *Gazzetta Medica Lombarda*, June 8, 1896, and *Giornale Internazionale delle Scienze Mediche*, March 31, 1897; Raoul Dumas, *Arch. de Méd. Nav.*, April, 1897; Grocco, "Hemoglobinurie Quinique chez les Malariques," *La Settimana Méd.*, Jan. 2, 1897.

Clarac (*Arch. de Méd. Nav.*, April, 1896) believes that the rarity of quinine hemoglobinuria necessarily depends upon some individual predisposition, the malarial poisoning simply acting as an added cause, for hemoglobinuria due to quinine is never seen when the drug is administered in full doses during typhoid fever or in acute articular rheumatism. According to Pampoukis hemoglobinuria due to quinine may be avoided by the administration of cinchonine.

Tomaselli asserts that the quinine produces not only the hemoglobinuria, but also icterohematuric fever easily confounded with the ictero-hematuric fever of severe infection.

The symptoms of ictero-hematuric quinine fever, according to this author (Congres de la Soc. Italienne de Medecine Interne, Rome, October, 1888), are that three to six hours after the ingestion of the quinine the patient is seized with a severe rigor. The pain is felt in the loins and lumbar region and unceasing bilious vomiting may occur. These symptoms constitute the first period of the intoxication and usually last about three hours. They are succeeded by a considerable elevation of temperature, amounting to hyperpyrexia in grave cases. With this rise in temperature abundant hematuria supervenes. The urine is passed frequently and is accompanied by alvine evacuations of a sero-bilious character, and dyspnea is also present. The entire surface of the body may be yellow in hue. The bloody urine contains altered blood, fibrin, cylinders, epithelial cells, and bile pigment. Tomaselli has observed both hematuria and hemoglobinuria, but believes that the latter is the more frequent condition. At the end of twenty-four to forty-eight hours

the attack terminates, defervescence is rapid and may produce collapse. Laveran asserts that this ictero-hematuric quinine fever has never been observed by him, and he seems to seriously doubt whether the quinine is ever responsible for this condition.

In regard to quinine eruptions Laveran states that they are quite commonly seen. Sometimes they are urticarial in character; in others they resemble scarlet fever. Cases of this kind have been reported by Floyer, Rizu, and Kobner.

Witherspoon has observed a remarkable example of quinine scarlatiniform erythema occurring in a woman. Fifteen minutes after the ingestion of the quinine there was intense itching and burning of the skin of the extremities and then of the body. The skin became very red and swollen. There was congestion of the conjunctiva and profuse secretion of tears, edema of the face, and roaring in the ears. The tongue became swollen and the pharynx became reddened; with the scarlatiniform eruption there was headache, nausea, vomiting, and the urine was scanty and high-colored. In the course of a few days the skin desquamated in large flakes as it does after scarlet fever. A similar desquamation took place in the mouth, the pharynx, and the tongue. Other doses of quinine given at other times produced the same effects in this patient.

Feulard reports a case of scarlatiniform erythema before the Société de Dermatologie, February 11, 1897; and James Johnston has reported a case of bullous dermatitis from the same cause. These quinine erythemas are evidently due to individual predispositions, just in the same way that small doses of antipyrin produce these eruptions in certain individuals.

According to de Grissac the exanthema which is produced by the administration of quinine internally is probably due to the irritating action of the alkaloid, a small portion of which is eliminated by the sweat (Guyochin, The Sulphate of Quinine Eliminated in the Sweat as the Sulphate of Quinine, Paris Thesis, 1872), and it is probable that this elimination in certain individuals is more pronounced and that the skin in consequence becomes greatly irritated.

In regard to disorders of vision, the deafness, and amblyopia, Laveran points out that quinine most frequently produces these manifestations if we except vertigo, and it is believed that the vertigo is largely dependent upon changes produced by the drug in the labyrinths; although, on the other hand, as pointed out by Lermoyez, this drug in cases of lesions in the labyrinth causing vertigo often does great good. Laveran states that quinine amblyopia is very rare, is generally complete and bilateral. A large number of references are given.

Laveran finally concludes his article by discussing the oxytocic properties of this drug. He first points out that certain writers have asserted that the prescribing of quinine to pregnant women after the third month is capable of producing abortion. Petitjean, Delioux de Savignac, Rayer, Merz, Monteverdi, Lewis and Warren have called attention to this fact, and in addition he quotes Chiara, Bazin, and Bertrand. Laveran seems inclined to believe, however, that the abortion in cases where quinine has been given has depended upon the malarial infection, and he quotes Duboue, Cordes, Bonfils and Schwab as stating that quinine is not an abortive agent, but that it has a stimulant action upon the uterine muscle during labor.

[In connection with this article we may perhaps be allowed to call attention to an editorial upon the Untoward Effects of Quinine published some time ago in the THERAPEUTIC GAZETTE, and to one or two Progress items dealing with the same subject. To those who are interested in the subject of the danger of quinine producing malarial hematuria or hemoglobinuria, we may refer to the article by the editor of this journal in the THERAPEUTIC GAZETTE for July, 1892, which consisted in a collective investigation extending over all the southern portion of the United States where malarial fever is prevalent.

In regard to the influence of quinine upon the pregnant uterus, we may refer to another original article in the THERAPEUTIC GAZETTE of July 15, 1897.—ED.]

REMARKS UPON THE PROPER SURGICAL TREATMENT OF TUBERCULOUS BONE DISEASE.

CABOT (*Boston Medical and Surgical Journal*, Jan. 27, 1898) contributes a valuable paper on this topic. He says that the surgical treatment of tuberculosis of bone is a subject about which it is difficult to generalize, for the varying conditions of the patient and the part affected often call for a corresponding variation of the plan of treatment.

Tuberculosis is an infective process against

which the tissues strive to protect themselves with various degrees of success in different parts of the body and in different persons. The process by which this protection is obtained is mainly by the formation of a wall of connective tissue, more or less dense, about the tuberculous mass, shutting it in and preventing its spread through the tissues. When this protective effort is of sufficient power to successfully resist the tuberculosis, it does so by thoroughly encapsulating the process, and in that case the masses of bacilli, cells and the waste products of the cells are compressed within a slowly contracting capsule and undergo cheesy degeneration until, finally, they may even be changed to chalky concretions.

The success of this limiting effort on the part of the tissues depends in a considerable degree upon the vigor of the individual, so that in tuberculous disease of bone (as is well known in tuberculous disease in the lung) a decided improvement in the surroundings and habits of the patient may bring about a cessation of the process.

In many cases of bone tuberculosis the surgeon's reliance must be upon the power of Nature to limit the process and must be directed wholly to the patient's general condition, with the added benefit of rest to the diseased part, which our back-braces, hip-splints and other fixative apparatus provide.

The numberless cases of recovery from joint tuberculosis in children attest the effectiveness of Nature's cure.

The most that we can hope from operation in tuberculosis of bone is the removal of a local focus which is acting injuriously in two ways: first, by interference with the functions of the bone involved; and second, by the general infection of the system with poisonous products elaborated at the seat of disease.

Tuberculosis of bone is generally a secondary process following some deeper infection. Its removal therefore is, as it were, only palliative and leaves somewhere the primary focus untouched. This primary focus is usually situated in the lymphatic system; not uncommonly in the glands connected with the respiratory or digestive organs. Commonly, also, this primary focus of the disease is well encapsulated, so that when the active and more serious focus of the disease is removed, the patient's return to health is gratifying and often long enduring.

It is interesting to consider what degree of thoroughness we can obtain in the removal of these local tuberculoses. By the amputation of a limb above the seat of disease the removal of the local focus is thoroughly accomplished. Occasionally a localized tuberculosis can be entirely dissected out with a considerable margin of healthy tissue around it. When this can be done without bringing the tuberculous parts in contact with the healthy, of course that will constitute a thorough removal. This is rarely possible in tuberculosis of bone on account of the difficulties of the deep dissection; and almost invariably the parts about are more or less infected with the bacilli during the process of removal. In operation upon joints this is particularly true; for the infected synovial membrane is often very difficult of removal, as it dips in between the ligaments and the surrounding muscles and must be dissected away piecemeal. During this slow dissection the freshly wounded surfaces are in constant contact with the tuberculous material.

Fortunately the tissues are able to dispose of a moderate dose of the poison, so that a removal that is approximately thorough answers almost as well as if it were absolutely so. It is probable that microscopical amounts of tuberculous material which are left behind are actually destroyed and removed by the tissues. Larger portions are encapsulated, and it is interesting to note that these operations, which are followed by thoroughly satisfactory healing, often leave behind them little foci of tuberculous material buried in the cicatricial tissue.

Accepting, then, the position that in these cases the surgeon's operation is necessarily incomplete and that Nature must even afterwards do much to accomplish the cure, it is plain how important it is for the surgeon to do all in his power to improve the patient's general condition and to so arrange his operation as to obviate a long confinement in bed, if possible.

The removal of tuberculous material must be as thorough as it can possibly be made, the bony focus being hunted up and entirely removed. Where possible, a considerable surrounding portion of healthy bone should be removed with it. This is usually accomplished in resections of the knee and elbow, and also in those cases of disease of the hip in which the tuberculous process is confined to the head of the femur. When, however, the pelvic bones are also implicated, this is more difficult of accomplishment.

When tuberculosis attacks bone in their

continuity where it is impossible to remove considerable portions of the bone without seriously interfering with the functions of the part, surgeons usually resort to curetting for the removal of the diseased portions. As these portions are softened, they can usually be quite thoroughly removed with the sharp spoon, and the harder consistency of the surrounding healthy parts gives us considerable help in determining when the diseased portion has been thoroughly removed. After such an operation it is not uncommon to see the surface curetted remain in a carious condition for some little time. This is due to death of the surface of the bone bruised by the instrument. And in some cases the presence of the tuberculous process reinfects the bone and leads to a continuance of the tuberculosis.

In the carpus and tarsus this recurrence of tuberculosis is almost certain to occur. This is doubtless due in part to the comparatively ill-nourished condition of these bones. Surrounded as they are by cartilaginous joint-surfaces, their periosteal envelope, through which they receive nourishment, is comparatively scanty. It is usually well, therefore, to wholly remove any of these bones that are diseased.

In the wrist the functional result after a removal of many of the carpal bones is usually not good, but in the ankle these operations, when undertaken in the young, give excellent results.

This brings us to speak of the effect of age upon our treatment of tuberculous lesion of bone. So great is this effect that we might almost say that the success of treatment in cases of tuberculosis, other things being equal, is in inverse ratio to the age—that is, the older the patient, the worse the prognosis.

It is often a nice question of judgment whether, in a certain patient, to choose a partial operation, as the removal of the diseased tarsal bones, for instance, or to give up any attempt to save the joint and accomplish a thorough removal of the tuberculous parts by amputation.

This same question as between a partial operation and amputation also arises in cases much exhausted by the disease, and many patients will recover after an amputation, which enables them to quickly leave the bed, who would succumb to the long suppurating process following extensive resection of the tuberculous parts.

The importance of getting patients quickly out of bed and out of doors has been dwelt upon. The local treatment should consist in giving the parts absolute rest and, if possible, applying gentle, even pressure over the whole seat of the disease. In some cases when removal has been very thorough, a complete closure of the wound may be adopted; and some cases of resection will do well when the wound is wholly closed or where only a slight dependent opening is left for drainage for a short time. In other cases where, owing to the difficulties of the operation, removal of the tuberculous parts is less complete, this opening is made not only to provide drainage but to afford access to the parts for subsequent treatment, with the hope of enabling and assisting the tissues to throw off the tuberculous process. This may be done by leaving the bony cavity widely open and packed with gauze, or, in case of a joint, by carrying through it large wicks of gauze.

We have in iodoform a substance which has, in a measure, a specific effect upon tuberculous material. It seems to act by stimulating the tissues to an adequate resistance of the tuberculous material left after operation. In a case of an extensive cavity iodoform is generally applied in the form of iodoform gauze or by the means of setons, which are very useful in the ankle- and wrist-joints. When we have considerable sinuses which it is difficult to reach in the application of gauze, iodoform oil affords a good means of applying the drug to the deeper parts, and often excellent results are obtained by its use.

Even after healing has been accomplished, it is usually important to protect the parts from motion for a considerable time by the application of apparatus, as, if motion is allowed, the disease is apt to reappear.

Sometimes in connection with the tuberculous process in bone we have very large abscesses in the soft parts. When all parts of these abscesses can be reached and thoroughly curetted, it is not uncommon to obtain a complete closure of the greater part of the abscess by stitching its walls together with deep-buried stitches, and if this can be accomplished it is the best method of bringing about a cure. In many cases, however, this thorough curetting is not possible, notably in cases of psoas abscess.

The danger of interference where the operation cannot be thorough is that, if large portions of tuberculous material are left, the infection of the denuded parts which have been curetted rapidly takes place, and this

new invasion of the freshly wounded tissue is often accompanied by considerable hectic fever, so that the patient is rather worse off instead of being improved by the attempt at thorough operation.

There is also considerable danger of infecting the parts with other organisms beside the bacilli and thereby bringing about a fever from infection by other pus organisms. In those cases, therefore, where the whole abscess cannot be thoroughly treated, it is wiser to make a small opening, large enough to allow of the discharge of the tuberculous cheesy masses which exist in these abscesses, and to then be content with the injection of iodoform oil and thorough drainage.

The gradual contraction of the walls of the abscess by reason of the cicatricial tissue surrounding it, and also by reason of the intra-abdominal pressure in cases of psoas abscess, usually brings about a satisfactory condition of improvement, although absolute cure of one of these abscesses is extremely rare.

THE SURGICAL TREATMENT OF FIBROID TUMORS OF THE UTERUS.

GOELET publishes a paper under this heading in the *American Journal of Obstetrics and Diseases of Women and Children* for January, 1898. He says the surgical procedures which may be adopted in this class of pelvic tumors are: curettage, division of the uterine arteries, myomectomy, both vaginal and abdominal, and hysterectomy.

Since electricity affords only symptomatic relief in a certain class of cases, and this is not always permanent, its use may be limited to inoperable cases, classing under this head cases where the constitutional condition or cardiac disease prohibits or where the patient refuses to consent to operation. The prejudice against operation for uterine fibroids is being rapidly removed, first, because the mortality of total removal has been greatly reduced, and second, because the feasibility of more conservative procedures has been demonstrated. For instance, an extensive myomectomy, where the uterus is the seat of numerous fibroids, is successfully done to-day and the uterus saved, whereas only a few years back the whole organ was removed in such cases. Again, it has been shown that complete atrophy of certain small tumors of this character may be brought about by permanent obliteration of the uterine arteries, which diminishes their nutrition. The possibility of conservative surgery is appreciated because the evil results of some of our older methods is pretty generally understood. Hence the author would say the prejudice against operative interference is being removed because surgery is less radical and the mortality of radical operations is reduced.

Of the operations enumerated above curettage may be regarded as a palliative measure only, to be employed for controlling temporarily the hemorrhage, which is often profuse and persistent, and which so rapidly exhausts the strength of the patient. It is to be employed also to overcome the obstinate endometritis when any procedure less radical than hysterectomy is done, such as division of the uterine arteries or myomectomy. It is a secondary but nevertheless an important auxiliary measure which should never, in the author's opinion, be neglected. It is only a temporary expedient against hemorrhagic endometritis, because the endometrium is rapidly reproduced, and, since the same causes which produced this condition still exist and have not been removed, the hemorrhage must sooner or later occur.

Of the method of performing this operation, which is generally regarded as simple, much may be said to advantage. It involves more risk in the fibroid uterus, because the walls may be quite thin in places, or soft and spongy and easily perforated. Again, owing to the irregularity of the cavity it is quite difficult in some cases to make the curettage thorough. The ordinary dilator employed for dilating the cervix is frequently inadequate because it is not sufficiently rigid, especially if the growth is near or encroaches upon the cervix, and because the blades of the instrument are too short to effect dilatation sufficiently far up. Great care should be exercised also to avoid exerting too much force or allowing the instrument to slip and produce laceration.

The ordinary curette is likewise inadequate in some cases, because it is too short and does not reach far enough up into the cavity, and it has not sufficient rigidity to enable the operator to remove all that is necessary.

The irrigator ordinarily used for washing out after the curettage is also too short to reach the full length of the cavity, and the tubing employed for conducting the irrigating fluid is too small to furnish a stream of sufficient force and volume even if the reservoir is placed high.

For curettage of the fibroid uterus, then, special instruments are required, and more

than usual care is necessary, both for safety and thoroughness.

In all of these cases the curettage should be followed by a copious irrigation, with a double-current irrigator, of a hot one-per-cent. solution of lysol to remove clots and débris, and after this a solution of iodine should be used through the irrigator. The strength of this solution may vary with the necessities of the case—from half to an ounce of the compound tincture of iodine to a pint of water. In the author's opinion this is the only way iodine should be applied to the interior of the uterus.

The operation for ligature of the uterine arteries, for the purpose of producing atrophy by depriving these tumors of sufficient circulation and nutrition, has been successful when it has been done in appropriate cases and when obliteration of the vessels has been made certain by dividing them. The author has pointed out elsewhere the fallacy of depending upon simple ligation to effect permanent obliteration of these vessels, chiefly because it is difficult to isolate them so that the ligature will destroy the artery; and if a mass of tissue is included in the ligature with the vessel, it shrinks in consequence of the compression and the ligature loosens. Consequently the circulation may be, and frequently is, restored. This would, of course, fail to accomplish the purpose of the operation.

The technique of this operation is as follows: First, the uterus is curetted, and if hemorrhage has been a symptom it is irrigated with a solution of iodine. Then a traction ligature is passed through both lips of the cervix, by means of which it is drawn well down and over to one side, the patient being in the lithotomy position with a short-bladed perineal retractor in the vagina. A semicircular incision is made through the vaginal roof on one side at the cervico-vaginal fold, and the base of the broad ligament is exposed by careful dissection with the fingers, hugging the side of the uterus. When the pulsation of the uterine artery can be detected, a stout silk ligature is passed around it by means of a specially devised aneurism needle or ligature carrier, and tied. Especial care is necessary to avoid including the ureter in the ligature, as at this point it is only half an inch from the uterus. The tissue between the ligature and the uterus is then divided with the scissors, and the uterine end of the artery is then picked up with a pressure-clamp and tied with silk or catgut. The same maneuver is repeated on the other side. The vaginal incisions are closed by continuous catgut suture and a loose dressing of gauze placed in the vagina. Of course, strict aseptic measures should be carried out, both in the preparation for and during the progress of the operation.

The limitation of this operation to such tumors as may be influenced by cutting off the supply of the uterine arteries is important, and upon this depends the success which may follow. It would be unreasonable to expect very large tumors which fill or nearly fill the abdominal cavity to be influenced materially by this procedure, since the other sources of blood-supply are greatly increased as the tumor develops out of the pelvic cavity. The uterine arteries are not the chief source of nutrition in these cases, as they are when these tumors are smaller. The other main channels of circulation, the ovarian arteries and round ligament arteries, are not only greatly increased in size, but these tumors are frequently fed by new vessels established through adhesions with adjacent organs and structures. When, however, the tumor is small or has not developed above the level of the umbilicus, the uterine arteries furnish the chief blood-supply. Likewise, when a subperitoneal tumor springs from or near the fundus, it gets its blood-supply chiefly from the ovarian arteries, and cutting off the uterine arteries cannot be expected to influence the growth materially in these cases.

This operation should therefore be limited to small interstitial growths which have not developed beyond the umbilicus, and small subperitoneal tumors which spring from the wall of the uterus below the fundus. When the operation has been confined within these limits, and when the author has made permanent obliteration certain by dividing the arteries, complete or almost complete atrophy of the tumor has followed.

Myomectomy ranks deservedly first in the order of conservative operations for uterine fibroids, being radical in its conceptions, though it preserves both uterus and ovaries. Until quite recently this operation had a very limited application and its possibilities were not fully appreciated. For some time past pedunculated tumors have been removed, and occasionally one or two small fibroid nodules projecting above the surface of an otherwise healthy uterus have been also removed by enucleation; but where there were numerous interstitial masses, or even

one large tumor, the uterus was invariably sacrificed together with the appendages. Even now, though the successful possibility of an extensive myomectomy has been satisfactorily demonstrated, there are many uteri being sacrificed every day for small tumors which might easily be removed without the uterus.

It is possible to remove successfully not only one or two but numerous interstitial fibroids, large and small, situated deeply in the uterine wall, shelling them out of their bed, closing the wound afterward by suture, and leaving the greatly hypertrophied uterus to regain its normal condition. The operation is one which requires much more operative skill than hysterectomy, and where it is extensive it is fraught with greater danger on account of hemorrhage and the increased risk of sepsis. Hence the strictest aseptic technique must be carried out. The ligatures and sutures must be applied so as to control absolutely all bleeding and close the wounds in the uterine wall perfectly, so as to avoid dead spaces where blood or serum may collect and undergo decomposition. There is practically no limit to the number of tumors which may be removed in this manner, and though the uterus may afterward resemble a battle-scarred veteran, it is saved to the patient and will subsequently recover and may be a useful organ.

A few points in the technique may be useful to those who are not familiar with the operation. The abdomen is opened by an incision sufficiently large to deliver the uterus with tumors out of the abdomen, when this is possible; the peritoneal cavity is protected by a sterilized rubber sheet or flat gauze pads, and when much bleeding is anticipated a rubber ligature is placed around the cervix. When the uterus cannot be lifted out of the abdominal cavity the intestines must be protected by gauze pads, which wall them off from the field of operation. Sometimes the Trendelenburg position is a decided advantage. In removing pedunculated fibroids a flap is made on either side of the pedicle at its base of attachment to the uterine wall. These flaps are stripped down and the pedicle severed by a V-shaped incision below the level of the surface of the uterine wall. Any redundancy of the flaps is trimmed off afterward. Bleeding vessels are controlled by pressure forceps, and, when necessary, a ligature, but both are to be avoided when possible. Free bleeding will be controlled frequently by the sutures employed for closing the wound, which may be applied immediately before the removal of other masses is proceeded with, or the wound may be packed tightly with sterilized gauze until all the tumors are removed. In removing sessile and deep interstitial growths the uterine wall over the center is split and the capsule of the tumor is laid open; then the tumor is shelled out of its bed by the fingers or the handle of the scalpel. It is important before closing the wound to trim out all loose tissue which would subsequently slough. Perfect coaptation is absolutely essential, hence deep-buried sutures, preferably of fine chromicized catgut, should be employed; Lembert sutures of the same material or fine silk used for the outer layer closing the peritoneal surface.

Two points must ever be kept in mind—the liability to hemorrhage and sepsis—and every precaution should be taken to avoid both. With care, however, the chance of either may be reduced to a minimum.

Usually this operation is best executed through an abdominal incision, as it affords freer access and permits more accurate work. But when there are only one or two small nodules projecting from the uterine wall low down near the cervix, their removal may be accomplished through a vaginal incision either anteriorly or posteriorly to the cervix, according to their location.

Myomectomy, then, should be the operation of election in all cases where it is possible without entailing too great risk. So strongly is the author convinced of the possibilities of this operation that he believes it is applicable in seventy-five per cent. of the cases where now hysterectomy is generally done.

Submucous fibroids projecting into the uterine cavity may usually be removed through the cervix, but it may prove a tedious and difficult operation if the tumor is pedunculated or detached, on account of the difficulty in dilating the canal sufficiently to permit free access into the uterine cavity. When these tumors are very large, however, and their development causes the uterus to project well up into the uterine cavity, a correct diagnosis of their exact character is not always easy, especially if the cervix is small and the canal is contracted. If a correct diagnosis can be made in these cases, it is not always possible to empty the uterus through the vagina. It is possible and feasible, however, in such cases to empty the uterus through an abdominal incision,

as in Cæsarian section, and leave the uterus behind if the walls have not undergone degeneration, thus saving it. If, then, upon opening the abdomen, either for the purpose of a myomectomy or a hysterectomy, it is found that the tumor is not in the wall of the uterus but within the cavity, the uterus should be delivered through the abdominal incision, a rubber ligature placed around the cervix, the abdominal cavity protected by a rubber dam or pads of sterilized gauze, and an incision made in the anterior uterine wall from the fundus to near the attachment of the bladder opening, into the cavity. If the tumor is pedunculated it is easily removed by severing the pedicle near its attachment. If it is broadly attached to the uterine wall the mucous membrane, with the capsule, is split and the tumor shelled out. Active bleeding is controlled by ligature or by sutures which compress and coaptate the raw surfaces. After the uterus has been emptied the cavity is washed out if necessary, and a gauze drain or rubber drainage tube is carried down through the cervix into the vagina. The incision in the uterine wall is closed by deep interrupted sutures of chromicized catgut, which include the muscular layers down to but not the mucous membrane. Done in this manner there is absolutely no chance of infecting the peritoneal cavity, and there is little or no blood lost. Though this operation may involve more risk than a hysterectomy in the same condition, it is fully justified, since it preserves the uterus, which may subsequently become a useful, functionating organ.

Of hysterectomy there is little to be said except as to its limitation. The author cannot now believe that vaginal hysterectomy for fibroid tumors is necessary or justifiable, since tumors which are sufficiently small to permit of their removal in this manner either may not be interfered with, or, if they are causing trouble, atrophy may be secured by dividing the uterine arteries; or if the condition is not appropriate for this operation, the abdomen may be opened, a myomectomy done, and the uterus saved. The conscientious surgeon would surely not sacrifice the uterus, to say nothing of the unnecessary risk to which the patient would be submitted, when these other channels are open to him. Abdominal hysterectomy for uterine fibroids is ever a justifiable operation in those conditions where other operations are not feasible, and especially when the tumor is so large as to cause great inconvenience from its size, or where the tumor has undergone degeneration or the appendages are hopelessly diseased.

The technique of this operation has been thoroughly discussed and is familiar to us all. Likewise the pros and cons of supravaginal amputation and total extirpation have been gone over again and again, and there would be nothing gained by repetition here, since the adaptability of either method is pretty generally understood.

AN EXPERIMENTAL INVESTIGATION INTO THE TREATMENT OF GUNSHOT WOUND.

In the *Zeitschrift für Chirurgie*, 47 Bd., 2 and 3 Heft, 1898, TAVEL, following the general plan of experimentation pursued by La Garde, comes practically to the same conclusions—*i.e.*, that extremely virulent bacteria carried by bullets into the tissues regularly bring about infection—and furthermore announces it as a fact that cleansing of the bullet track by antiseptic washing or cauterization is futile in preventing the development of general symptoms. The death of the animals experimented upon occurred when the bullet was fired through infected material and when the wounded part was wrapped in fabric which had been infected.

Following this article of Tavel's is one by KOHLER detailing his laboratory experiments conducted with the idea of discovering what means are likely to prove most efficacious in combating the infection incident to a gunshot wound. Kohler states that we may take it for granted that gunshot wounds are infected, frequently because the bullet itself is not sterile, but usually because in its course through the clothing and skin surface it will necessarily carry germs with it. It is evident, however, that this infection is not necessarily by the most virulent germs, and is often quantitatively slight, so that the tissues themselves, even though they are wounded and devitalized, may be sufficient to inhibit the further development of germs. Kohler in his experiments infected the ends of bullets with germs that are virulent to guinea-pigs. As a result of his work he holds that in the treatment of uncomplicated gunshot wound it must always be remembered that it is possible that the wound may be absolutely sterile, or that it may be but slightly infected and with non-virulent germs, or that it may be abundantly infected with virulent germs.

As to which of these three conditions is present it is impossible to determine at once, hence the earliest treatment should be the application of a sterile bandage for the purpose of preventing secondary infection from without. A reactionless course shows the absence of infection, or a very slight one. When the wound is obviously infected drainage is always indicated. The use of the thermo-cautery, tincture of iodine, five-percent. carbolic acid solution, all increase the virulence of the germs which are not directly reached by these agents and encourage the quick development of blood poison. The principle of closing at once all gunshot wounds is an extremely bad one. The simple and uncomplicated ones may be thus treated, but those which are extensive, and especially those into which have been carried portions of clothing, should be drained.

In this relation it is interesting to note that Müller as a result of a research comes to the conclusion that drainage must be regarded simply as an indifferent medium which provides for the discharge of wound secretions. Its importance depends upon the fact that it relieves tension and puts the wound in a favorable condition for healing. Tincture of iodine, he states, is an agent which penetrates tissues and weakens bacteria. The thermocautery, whilst destroying bacteria with which it comes in contact, favors the destruction of the tissues. Energetic means employed against the infection of gunshot wounds are useless.

EXTRAPERITONEAL RUPTURE OF THE BLADDER COMPLICATED BY FRACTURE OF THE PELVIS; REPORT OF A RECENT CURED CASE, WITH A STUDY OF NINETY CASES COLLECTED FROM LITERATURE.

MITCHELL reports the following case in the *Annals of Surgery* for February, 1898:

A Lithuanian woman, aged fifty-two years, was admitted May 20, 1896, to Johns Hopkins Hospital, in the service of Dr. Halsted. On May 19, about 11 P.M., ten hours before admission, she was thrown from a wagon, the wheels passing over the hips and lower abdomen at the level of the anterior iliac spines. On admission at 9 A.M., ten hours after the accident, the pulse was 120; temperature 100° F.; mental condition seemed one of stupor. There was frequent moaning, and when the left hip was moved she cried out with pain. Over the lower abdomen and thighs the skin had been scratched and was covered with gravel and dirt; the entire superficial epidermis seemed to have been brushed away, but at no point was the fat exposed. The abdomen was not distended nor tender except over the skin bruises, and there was no muscle spasm nor any evidence of intra-abdominal injury. Catheterization at 10.30 A.M. yielded 140 cubic centimeters of smoky urine, with a sediment of blood-corpuscles; and at 2.30 P.M., four hours later, 160 cubic centimeters of similar urine. On distending the bladder with 500 cubic centimeters of boric acid solution, not more than 250 to 300 cubic centimeters could be withdrawn, and examination by means of a speculum showed the bladder to be quite empty, demonstrating conclusively a rupture. It was impossible to ascertain whether urine was passed before admission, but between admission and operation there was no attempt to void urine, and there was no dribbling.

Dr. Bloodgood operated seventeen hours after the accident, under ether. On opening into the space of Retzius, through the middle line, it was found filled with a large quantity of blood-stained urine, which was not ammoniacal, and there was as yet no sign of inflammation. The peritoneum was pushed up to within four centimeters of the umbilicus, and in the lumbar region almost to the margins of the twelfth ribs. This fluid was carefully sponged out, and the peritoneal cavity opened in the middle line to examine the bladder for any intra-peritoneal opening. As none could be found and there was no fluid in the peritoneal cavity, the peritoneum was closed with a double row of silk sutures. The opening in the bladder was demonstrated by passing a silver catheter through the urethra. It appeared to be about two centimeters to the left of the median line at the level of the pubes—that is, just behind the seat of fracture, which was in the ramus of the left pube. The line of fracture was oblique, and two ragged points projected towards the bladder. The bladder wound was closed with silk sutures, not including mucous membrane. Lateral incisions were then made in both inguinal regions, and the three wounds were packed with bismuth gauze, the upper half of the median incision being closed with two mattress sutures in the recti muscles, and a continuous subcutaneous silver suture. There was no loss of blood, and the pulse was excellent at the end of the operation.

Temperature 100.2° F.; pulse 106. Cultures and cover-slips from the extravasated fluid were negative, and there were only a few leucocytes.

The patient passed a fairly comfortable night. From 8 P.M. the day previous until noon the following day she was catheterized seven times, twelve to thirty-five cubic centimeters of urine being obtained each time, amounting in all to 162 cubic centimeters of bloody urine. The gauze on the abdomen was saturated with urine, showing that the sutures of the bladder had not held or that there had been another rupture. Temperature 102.2° F.; pulse 106 to 110; respiration 30 to 35; condition of stupor more marked than on admission (3.30 P.M.). Patient placed in bath of water at 100° (8 P.M.), and in four hours the pulse was 100 and of better quality; respiration 24, and decidedly improved; temperature 100.8°. The condition of stupor was replaced by a much brighter mental state, and the patient looked a great deal better.

The patient was taken out of the tub five days later for four and a half hours, during which time no urine leaked from the wound. There was some pain and a little hemorrhage. Removal of the packing was followed by a rise of temperature to 102° F., but no discomfort.

The patient remained almost continuously in the bath for eighteen days, being removed only for an hour at a time to clean the tub, and then crying to be returned. The pulse was good, but there was continuous fever from 100.5° to 101° F., and on the seventeenth day, after examination and removal of two small pieces of bone from the fracture, the temperature reached 103.5°. The packing was taken out May 26 (seventh day). The lumbar wounds closed two days later, and the brush-braze wound had entirely healed. The abdomen was soft and there was no evidence of infiltration beyond the suprapubic sinus. Appetite and general condition good.

At this time there was more or less fever and several shaking chills, the temperature in one instance reaching 107° F. Examination of the blood was negative, and there was no leucocytosis. The urine showed a faint trace of albumen and many polymorphonuclear leucocytes. The abdomen was soft and not distended, and nothing could be found indicating any accumulation of pus. Spleen and kidneys not palpable. On irrigation the opening between the suprapubic wound and the bladder was not large enough to prevent distention of the bladder, and 250 cubic centimeters could be retained. On examination of the suprapubic wound a small cavity was found just to the left of this sinus, and communicating with it by an opening two to three centimeters in diameter. This was thoroughly dilated with the index-finger and packed with bismuth gauze. Extravasation of urine into this cavity probably explains the chills and temperature.

Following the dilatation of the cavity named the temperature fell rapidly, and there were no more chills and no rise of temperature. The patient was removed from the bath on June 28, forty days after the accident. Since then the sinus and bladder have been irrigated daily with boric acid solution, and on July 20 the gauze removed from the sinus was slightly moist with urine. The sinus closed rapidly. Two months after the accident the patient was about in a wheel-chair and fairly comfortable, with the exception of some swelling and pain in the left leg and hip.

Improvement continued progressively until the patient was discharged well on March 3, 1897. She walks without difficulty, and there is no evidence of mobility at the seat of fracture.

Considering the great numbers of surgical cases of all kinds treated in hospitals, neither fracture of the pelvis nor rupture of the bladder is of frequent occurrence; for statistics show that in Berlin in 10,867 surgical cases there were only three ruptured bladders, and in London in 16,711 cases only two. In the Johns Hopkins Hospital, among 7000 surgical cases there have been three ruptured bladders.

It is generally stated that fracture of the pelvic bones compose about one per cent. of all fractures. Either lesion is a serious one, but with the two combined the prognosis is always grave.

The injury is met with much more frequently in men than in women, and most commonly between the ages of twenty and sixty—that is, in the most active period of man's life, when his habits and occupation expose him to violence. Harrison, of Dublin, has thought the greater frequency in men due also to the greater size of the female pelvis, and because of the pad offered by the uterus as a protection to the bladder. In boys the bladder is not as likely to be allowed to become distended, an important factor in the causation of rupture; while after sixty a

man has usually retired from active and dangerous service.

The symptomatology is quite definite. After the accident the patient is usually unable to walk or even to rise from the ground, and is often rendered unconscious, though accounts are given of patients walking some distance. Peaslee reports a case of a man who, with seven fractures and a ruptured bladder, could actually walk a few steps. The subjects often describe a sensation of something tearing within them at the time of accident. They are brought to the hospital in a semi-stupid condition, complaining of intense pain in the hypogastric region, or at the seat of fracture. Many go at once into a state of collapse or coma, from which they never rally, dying in a few hours. A pretty constant and characteristic symptom is a great desire to micturate, with either total inability to pass any urine or the passage of a small amount of blood-stained urine or pure blood. Sometimes, however, urination is not interfered with, and the patient voids perfectly clear urine. These are rare exceptions. Again, the patient may at first pass no urine, but after a time be able to do so. There may be one or repeated shaking chills.

The prognosis has always been grave, though with the progress of surgery the death-rate has greatly lessened. Hippocrates thought rupture of the bladder necessarily fatal, while Galen admitted the possibility of recovery in extraperitoneal injuries. In 1878 Bartels collected 169 cases of ruptures of all varieties, with a mortality of 89.3 per cent., and at that time there was only one recorded recovery in intraperitoneal rupture. Cramer in 1896 gave the mortality for all forms as fifty-four per cent. This drop in the death-rate has been to a large extent due to the improved treatment of intraperitoneal cases. In our ninety reports there were fifteen recoveries, making the mortality 83.3 per cent. Taking only those which have occurred in the last fifteen years, we find twenty-four, with seven recoveries—*i.e.*, a mortality of 70.8 per cent.; so that in extraperitoneal rupture the decrease in deaths has not been so great, and it is still considered a very grave injury and one whose treatment has been rather unsatisfactory. When we consider how likely it is to have only recoveries reported, it is not probable that this estimate is an exaggerated one. In the majority (fifty-five per cent. of the collected cases) death occurred in the first four days, while in the first week seventy-three per cent. died. Those surviving the first few hours rally from the shock and later show signs of peritonitis or extravasation of urine; the lingering cases die generally of septicemia.

The treatment, therefore, is plainly indicated, viz., immediate evacuation of the extravasated urine and prevention of reaccumulation by proper drainage and suture.

As far as the fracture of the pelvis is concerned little is to be done except to fix the parts, though it is sometimes necessary to remove spicules of bone or wire the fragments together.

To get rid of the extravasated urine has been a simple matter, but the question of efficient drainage seems to have been a difficult one. The earliest cases were treated by hot applications, leeches, and blood-lettings, and two recoveries are reported in fifty-three cases where no other treatment, save these and catheterization, was employed.

In all thirty-seven cases were treated by various operative procedures with a resulting mortality of 64.9 per cent. In many of the recoveries the convalescence has been slow and tedious, with a history of long continued suppuration, and the existence of one or more fistulous tracts for months or years.

Statistics show nothing as to the advantages of early operation, for there were more recoveries where the operation was in the second week. But we know that it is best to operate as soon as possible, and it is a question as to whether these late cases would not have recovered spontaneously by rupture of the abscesses and formation of fistulæ.

The first attempts at operation amounted merely to incisions for extravasation plus a catheter retained in the urethra. Of eight cases so treated, three recovered. The recoveries were cases which had gone on to abscess formation, and all that was done was to open the abscesses.

In 1845 Walker, of Boston, first employed lateral perineal cystotomy in a case of ruptured bladder, and drainage through this incision was successful, and the patient recovered. After that perineal incision and drainage was the favorite method, and in sixteen cases there were four recoveries.

Abdominal incision was employed five times, with one recovery; and then suprapubic cystotomy, with or without a counter incision in the perineum, took its place, and has been up to the present time the ordinary method of dealing with this injury, but of eight patients treated in this way only three recovered.

In three cases, including the present one, the continuous bath has been used to prevent absorption and for better drainage, and all of these have recovered. While the bath treatment of wounds is itself an old one, and has long been known and employed, both in this country and abroad, its application in such injuries as the present one seems to have been gradual, and its great value should be insisted upon.

In 1878 Bartels speaks of "giving baths" to a case in which there was extensive suppuration, and the patient got well; but he does not go into details as to the time the patient remained in the baths. In 1891 Rose, after doing a suprapubic operation for rupture, found that ordinary dressings were not sufficient, and says that "therefore the patient was every day put in a continuous bath for several hours without any dressing." This was continued for twenty days, and then the bath was used only every second or third day. The second case in which it was employed was in 1896, by Wiesinger. Here on the seventeenth day an abscess was opened over the seat of fracture, and the patient put in a continuous bath. The abscess was healed on the forty-second day.

It would seem, then, that whether there be merely incisions for extravasation or whether suprapubic cystotomy or perineal section be performed, the best results can be secured by placing the patient in a continuous bath.

While at first patients may object to the bath, probably more from the thought of it than from actual discomfort, they soon grow accustomed to it, and, as has been said, the present patient when removed from the tub cried to be returned.

Dr. Bloodgood has already reported a case of ruptured urethra in which the bath was used with excellent result. It has been used by Schede in cases of extravasation of urine, and last year Puzey, in London, reported two cases of ruptured urethra, which recovered under the bath treatment. Thus it would seem to be especially adapted to this class of injuries, where efficient drainage is so important and so difficult.

The author has collected ninety cases of extraperitoneal rupture of the bladder; eighty-four occurred in males and nearly fifty per cent. between the ages of twenty and forty. As to the causes of the injury, twenty-three were due to crushing by weight falling on the body; twenty-five by being run over by a wagon; twenty-two from falling from a height. Of the total number of cases seventy-five died—*i.e.*, 83.3 per cent. Fifty-three of the fatal cases died in the first week—twenty-nine on the first day. Eleven cases were operated on within twenty-four hours; four recovered. Of seven cases operated on between two and five days none recovered. Of seven cases operated on within two weeks five recovered. Injuries complicated by multiple fracture in forty-two cases. The mortality of the unoperated cases was 76.2 per cent.; that of the operative cases 64.9 per cent.

DISINFECTION OF THE HANDS.

MENGE (*Münchener Medicinische Wochenschrift*, No. 4, 1898), while contesting the claim made by Reinicke, Ahlfeld and Vahle that the skin of the hands can be thoroughly disinfected by mechanical and chemical means, especially by means of washing with alcohol, recognizes the fact that this medium has distinct bactericidal powers, especially in regard to those vegetative bacterial forms which have lowered resistance, and that it infiltrates all the superficial layers of the epithelium. Moreover, from its hardening influence, its power of abstracting water, it retains the more resistant forms beneath the epiderm. The especial advantage it possesses is that it does not act upon the living cells of the body. It is worthy of note, however, that if after a thorough brushing with alcohol the hands are subsequently soaked in water or the fluids of the body, the epidermic layers again become softened, desquamate, and may enable spores or other resistant forms of life to escape into the wound. For this reason the use of gloves is particularly advisable. Those employed by Mikulicz, Zweifel and others are of stockinette and extremely thin. They can be readily sterilized by heat and should be worn by the assistants who hand instruments, handle dressings, thread needles, and perform other work accessory to the operation. They are also satisfactory when applied by the surgeon himself, provided he operates by the dry method. If, however, he employs lotions, or if the operation is such that the gloves are necessarily soaked with the fluids of the body, the skin of the hands becomes wet, the shedding of epithelium takes place, and infection may readily pass through the thin porous substance of which the gloves are made. The objection made against gloves that they lesson tactile sensibility, though tenable, is not prohibitive, since by use the surgeon soon becomes accustomed

to them and since he can discard them at any moment if it should be necessary, as before putting them on his hands should be disinfected exactly as if he were not to wear them.

Fritsch has raised the objection that by the rough surface the gloves more or less injure the living cells, an objection which has also been raised to sponging. This can be obviated by the use of rubber gloves, the main objection to which lies in the fact that they are extremely hot and are readily torn or cut in tying down ligatures, inserting sutures, or operating with a knife.

To provide gloves which will be cheap, easily disinfected, and yet impervious to water, is the object of Wolffler. He states that the requirements of surgical gloves are that they shall be water-proof, smooth, comparatively durable, not hot or irksome to wear, and readily disinfected. To meet these requirements Menge, having thoroughly dried the stockinette gloves, immerses them in a solution made up of 100 parts of xylol and 20 parts soft paraffin, which melts at a temperature of 45°C. This fluid is warm and the gloves are allowed to lie in it for a quarter of an hour. They are then wrung out and dried in a warm oven. Water and the fluid ascites flow from the surface of this glove exactly as from that of a feather. It is not, however, absolutely impervious to liquids. It fits the hand neatly and presents a comparatively smooth surface. It is not easily torn or cut and is comfortable to the hand, since it still remains porous. It can be sterilized by steam under pressure. It is cleansed by using soap and hot water.

Menge states that since alcohol lessens the spaces between the epithelial cells and makes a more compact layer which practically encloses and prevents from escaping germs which may lie in its substance, it would be well for the surgeon not to employ any watery solution after having used the alcohol. To prevent the fluids of the body doing away with the beneficial effect of alcohol, he suggests that after the thorough cleansing the hands should be washed in the paraffin-xylol solution and dried with a sterile towel. The epidermis after this procedure seems almost unaltered, excepting that it is somewhat more shining. Water runs from the surface as it would from oil-cloth, and softening of the epidermis is impossible. Thus the germs which lie in the deeper layers of the skin and are not destroyed by the antiseptic solutions are kept there even though the hands are soaked in watery media a long time. Of course this does not provide for the bacteria which eventually escape through the openings of the skin glands. This protective coating also serves against the entrance of septic material through the skin of the surgeon's hands. The thin water-proof coating may be removed by rubbing with ether and washing with hot water, alkaline soap, and a brush.

Menge suggests the following method of disinfecting: Thorough mechanical cleansing by means of hot water, alkaline soap, and a brush, careful attention being paid to the nails; after that long-continued softening of the hands in water, then thorough disinfection of the skin by means of a watery or weak alcoholic solution of sublimate, and soaking of the skin in seventy-per-cent. alcohol and drying with a sterile towel, finally pouring a paraffin-xylol solution over the hands and again drying with a sterile towel.

TREPHINING THE SKULL.

Bratz (*Centralblatt für Chirurgie*, No. 3, 1898) calls attention to the fact that the requirements of modern brain surgery demand methods of opening the skull quite different from those commonly employed twenty years ago. The raising of large flaps by the hammer and chisel is open to the objection that a certain amount of concussion of the brain is produced; moreover, in breaking the bridge of bone across there results a certain amount of splintering. The concussion effect can be readily imagined by any one who has had a tooth plugged. A similar jarring of the skull results from the use of the rotary saw. The traction saw devised by Gigli is not open to these objections. This instrument is also strongly recommended by Obalinski on the basis of extensive experience. This method must be recognized as a distinct advance in brain surgery. The author has so used this instrument upon the living and has experimented with it upon the cadaver.

The method is especially to be commended because of the slight amount of bony tissue which is destroyed, the resulting solution in continuity appearing as fine cut. In replacing bone flaps thus formed the fit is exact. Also, the incision through the bone can be made oblique, so that the outer surface of the flap is greater in area than the inner. The operation has the further advantage that the formation of flaps is much more quickly accomplished than by other methods. Obalinski commends the Collin perforator, with

small trephine crown, as the best instrument for making the openings through which the saw is to be passed. This instrument is somewhat complicated in construction and difficult to hold in place. The author has constructed an instrument very much on the principle of a brace and bit employed by carpenters, which he strongly commends. In forming the flaps Obalinski directs that a tongue-formed incision should be made in the soft parts, the periosteum should be raised somewhat, and in the line of the incision—*i.e.*, the line of the bone flap—five to seven small openings should be bored through the bone. Two more openings should be drilled through the base of the flap. With a fine elevator the dura is separated from the bridges of bone lying between the openings by means of a curved probe or a bent cannula.

The Gigli wire is passed beneath the bridge to be divided. By pulling this wire to and fro the bone is separated without the use of force and without the faintest jar of the brain. The fine openings through which the saw is to be passed should be not less than one inch nor more than two inches apart; the cannula and the probe or grooved sound, which is used to guide the Gigli wire, should receive various curves in accordance with the distance to be traversed. To protect the dura, which is likely to be cut in the first movements of the saw, the author uses a wire loop passed from one opening to the other. The opening he makes with a bone drill the size of 28 F. catheter. He runs this rapidly down until the point begins to penetrate through the internal plate; the rest of the clearing is done by a species of rongeur. The saw is drawn through by means of a thread attached to the end of the probe.

THE CURE OF VESICO-VAGINAL FISTULA BY THE FREE DISSECTION OF THE BLADDER FROM ITS VAGINAL ATTACHMENTS AND CLOSURE WITH THE BURIED CONTINUOUS TENDON SUTURE.

MARCY (*Journal of the American Medical Association*, Nov. 20, 1897) contributes an interesting paper on this topic. In 1887 the author's attention was called to the ease with which the bladder-wall will reunite after injury, under the most adverse circumstances, when the portion involved is free within the peritoneal cavity. The case upon which he operated at this time was that of a child eighteen months old, where an abscess in the vicinity of the appendix had resulted in a vesico-intestinal fistulous opening in the appendiceal region.

Laparotomy disclosed two fistulæ of the small intestine, complicated with an opening into the bladder to the right of the fundus. The intestines were freed from adhesions and drawn out of the wound. The refreshed edges of the openings were closed by double lines of fine continuous tendon sutures, which in turn were intrafolded by a second layer of continuous tendon Lembert sutures. After the intestine had been returned, the bladder-wall was freed from its adhesions, and the opening into it refreshed and sutured in double lines of continuous tendon sutures, in precisely the same manner as he had closed the intestinal wounds.

The child made an easy and perfect recovery, with primary union of the openings, and is to-day a strong, vigorous girl. The age of the child rendered drainage of the bladder unsuccessful, but from the first the function of the organ seemed little impaired.

The case was instructive in many ways. Perhaps the most important lesson was the primary restoration of the bladder-wall without the supposed necessary physiologic rest of the organ. The method of applying the first row of sutures in the approximation of the freshened edges, held in even support by means of the continuous sutures, inverted the mucous membrane.

The insertion of the suture in both intestinal and bladder-walls is done as follows: The needle is a fine one, curved upon the flat, with eye near the point, and set in a firm handle, made to penetrate the coats of the bladder or the intestine also, but not through the mucous membrane. It emerges about one quarter of an inch from the line of the opening, and is introduced upon the opposite side at a like distance. The needle is then unthreaded, rethreaded with the opposite end of the suture, and withdrawn. This makes the needle a suture carrier like a shuttle, and holds in even coaptation the included structures in a double loop from side to side (shoemaker's stitch). One stitch follows another in an even continuous seam, until the opening is completely closed. By this side-to-side coaptation, the parts enclosed are held in juxtaposition the breadth of the enclosing loop, while the interrupted suture holds only the width of the suture material. The submucous penetration of the needle buries the suture in healthy vitalized structures, and the

line of stitches, taken a quarter of an inch away from the edges of the wound, inverts the mucous membrane into the bladder. The final fixation of the suture is by one knot, a manifest advantage over leaving as many knots as stitches, while the continuous suture permits of an even adjustment of the enclosing force. It must be remembered that no undue force is used in the tightening of the stitches, since readjustment, retention, and rest, with a minimum of devitalization, are the factors in the relation of the sutured parts as important as in the treatment of a fractured bone.

The exterior line of continuous Lembert sutures intrafolds the peritoneum so as to reenforce and greatly strengthen the structures over the wound. When taken properly they are themselves buried without puckering of the peritoneum (parallel continuous suture).

The author cannot himself question that the primary cause of failure, the surgical technique having been satisfactory, lies in the anatomic conditions, the importance of which a study of the physiologic functions of these different organs makes easily apparent. The contraction of the circular fibers of the vaginal muscle tends constantly to pull upon the base of the bladder, and these muscular contractions are necessarily called into special activity following the irritation incident to the repair of a vesico-vaginal fistula. When both the bladder-wall and the vaginal muscle are united by sutures, holding them in approximation, the contraction of the vaginal muscle not alone pulls upon the suture, causing it to cut through its own structure, but at the same time acts with equally destructive force upon the enclosed bladder-wall. The author believes it is on this account that the great majority of failures to cure vesico-vaginal fistulæ ensue.

Reflection on the diverse physiologic relationship of the parts involved must lead to the conclusion that this is a hitherto overlooked important factor for surgical consideration, and the author invites the profession to give it due consideration in order to profit, as far as possible, from its better understanding, by the adaptation of improved surgical methods.

Every one who is familiar with anterior colporrhaphy for cystocele knows the comparative ease and safety with which a large portion of the vaginal muscle may be dissected from the dependent posterior bladder-wall, and the almost sure complete primary union which ensues upon its fixation and closure.

It is safe, and not very difficult, having split the edges of a refreshed vesico-vaginal fistula, to separate widely the bladder from the vagina. When this has been effected, but not until the dissection is complete, the opening in the bladder-wall is refreshed and closed by a double line of continuous sutures, as already described, carefully avoiding penetration of the mucous membrane, using for suture material a fine tendon.

By the use of a needle with the eye near the point, the suture is carried back and forth through the same stitch opening, precisely as the shoemaker sews leather.

The opening in the viscus is then closed by an even, uniform support, coaptating but not unduly compressing the enclosed structures. A single knot fixes the suture, a fact of considerable importance when the material used is to be left buried. The free dissection makes the union of the bladder-wall a comparatively easy operation, and even when a large portion of the vaginal wall has been lost there is little difficulty in effecting an easy uniform closure without tension of the bladder-wall. As every operator knows, in large fistulæ, when the vaginal structures are enclosed with the bladder-wall, this part of the operation is exceedingly difficult, and the tension upon the parts which follows is the usual cause of failure.

The bladder-wall having been closed, we have remaining an operation not unlike that ordinarily undertaken for the cure of cystocele, with the exception that oftentimes the remaining vaginal structures are unduly minimized. How these structures shall be closed, so far as the cure of the fistula is concerned, is comparatively of minor importance. It is wise, however, to restore them as nearly as possible to their primal condition. The author thinks this is best effected in a general way, a method which for years he has continuously practised, by the use of a single tendon suture applied with a Hagedorn needle, using a lacing stitch, the sutures being deeply embedded from side to side. In this way the vaginal wall is coaptated in two or three layers and the mucous surfaces of the vagina are carefully approximated. This results in an entirely closed wound, the antero-posterior diameter of which has been considerably increased—in the first place, by the inversion of the mucous membrane of the bladder; in the second place, by the approximation of

the widely denuded structures upon the median line; and in the third place, by the inversion of the approximated vaginal surfaces of the wound.

Mackenrodt, of Berlin, in 1894, advocated a free dissection not unlike that which the author has above described, after which he united the wound in the bladder with fine silkworm-gut sutures. Then he closed the vaginal wound by drawing the body of the uterus forward so as to give the parts as far as possible a support from this organ.

Schauta in adherent vesico-vaginal fistula advises a vertical incision, lateral to the left labium majus, dissecting down to the descending ramus of the pubes; separation of the cicatricial tissue, walls of the vagina and fistula from the bowels by means of a periosteal elevation as far as the obturator foramen.

Ferguson advocates the following method of closure: The fistulous opening being exposed, an incision is made through the mucosa of the vagina at the distance of a full eighth of an inch from the opening of the margin of the fistula. This incision is extended until it completely encircles the opening. The line of the incision is carefully deepened until the lining membrane of the bladder is reached, and great caution is exercised in retaining the integrity of that membrane. In this manner a circumfrontal flap, hinged by the mucosa of the bladder, is obtained. This flap is inverted into the bladder and held in position by a continuous catgut suture. There is no loss of tissue, and a very broad surface is obtained for apposition.

Walcher advocated cutting away all tissue, and without making it apparent as to the purpose, he evidently frees the bladder from its vaginal attachments and unites the bladder wound with catgut sutures taken one-fourth of an inch from the edge of the fistula. After these have all been inserted they are tied. The bladder having been thus closed, the vaginal flaps are united by a line of silk sutures.

Kelly, of Baltimore, has made a valuable contribution on this subject, in which he reverses in large measure this very process, by dissecting the bladder, from behind forward, from its uterine attachments quite beneath the reflected peritoneal fold, and in this way is enabled to draw the posterior wall of the bladder downward by a layer of fine interrupted silkworm-gut sutures, taken inferiorly through the bladder-wall and its vaginal attachment. In the illustrated case Dr. Kelly thought this measure advisable, because of the relation which the ureteral openings had to the bladder wound. The results seem to have justified the novel measure employed, and yet the author is very sure the conditions will be rarely found which render this method of procedure advisable. We are deeply indebted to Dr. Kelly for bringing to the attention of American surgeons and emphasizing the importance of the catheterization of the ureters prior to operation upon large vesico-vaginal fistulæ.

Marcy claims for his method the following advantages: The ureters are not involved; the uterus is not included as a factor of repair; the method is easier to apply where the destruction of the tissue is so great as to include the upper part of the urethra. This the author believes to be important, but it does not seem to him that the union of the posterior bladder-wall with the anterior vaginal wall is ever to be advised when lateral approximation upon the median line can be effected.

The advantages he claims for his method are apparent. It is based: (1) on the anatomic and physiologic relationship of the approximated organs; (2) on the comparative ease of operation made possible by a free dissection; (3) the far greater possibility of cure of large vesico-vaginal fistulæ, where a considerable portion of the vaginal tract has been lost; (4) the great advantage obtained from the lateral approximation of the structures on the median line; (5) by the use of aseptically buried tendon sutures the parts are held at rest in apposition and primary union follows, with no subsequent care of the wound and no removal of sutures.

CONSERVATIVE SURGERY OF THE SPLEEN.

JORDAN in *The Lancet* of January 22, 1898, presents a valuable statistical article under this heading. With regard to the operation, under chloroform the abdomen and thorax were well washed and the left side was shaved and rendered as aseptic as possible. An oblique incision three inches long was made an inch below, and parallel to, the margin of the ribs. The spleen was brought gently out of the wound, lower end foremost, only as far as was necessary, the upper end not being exposed except when this was the end removed. A pair of Spencer Wells' forceps was applied to the lowest arterial branch where it entered the hilus; another

pair of forceps was applied to the same artery about a quarter of an inch farther from the spleen; the tissues between these forceps were then divided with scissors and two more forceps applied, as before, to the next vessel. In this way the gastro-splenic omentum was divided without loss of blood and without undue strain on the pedicle up to the level of the proposed division of the spleen (several arterial branches were left to supply the upper end, which was to be retained). The forceps on the spleen side of the divided gastro-splenic omentum were then laid along the inner surface of the lower end of the spleen, and an assistant raised this end with the forceps so that both surfaces of the spleen were well in view. At the level where it was decided to divide the organ the blood-flow through it was arrested by a continuous ligature used in the following way: A long needle threaded with fairly coarse silk twist one and a half feet long was inserted on the inner or "under" surface about half an inch from the edge or border and passed through the thickness of the spleen, emerging on the outer or "upper" surface about the same distance from the edge; the ligature was drawn through until the ends were equal; the free end was then brought up round the border of the spleen and a "double turn" made with the two ends and drawn as tightly as possible, this "turn" being kept through the spleen on the occluded side of the organ as close to the line of ligature as possible and an eighth of an inch to the "edge or border side" of the turn. This was done in order that the next loop should include the spleen where the needle had previously passed through, so that any oozing along this track should be stopped when the loop was drawn tight. The needle was then repassed through the spleen from the under to the upper surface half an inch further on, and a double turn again taken and drawn tight. Continuing in this way the breadth of the spleen was traversed. A reef-knot was then tied and the ends were cut short. The needle may be passed from the upper to the under surface and the turns made on the under surface, but the way described is the most convenient. The occluded end of the spleen was then cut through close to the line of ligature. Separate ligatures were tied round each portion of the gastro-splenic omentum included in the forceps, any tension on the pedicle being relieved as these were tightened. The peritoneum and the three muscular coats were severally united with continuous sutures, the skin incision not being closed. The whole operation was completed in from fifteen to twenty minutes.

The points in the operation which the writer emphasizes are: (1) Its great facility, especially when the double turn is made by twisting the needle round the free end and so getting this double turn on the needle before drawing tight. (2) The oozing which takes place during the passage of the needle is at once checked by the coarse silk, and stopped altogether when the loop is drawn tight. (3) The section of the spleen was absolutely bloodless, except in one case, where a middle loop had not been tied tightly enough; here bright arterial blood oozed away gently, but a similar ligature at that point, tied tightly, at once stopped the bleeding, which did not exceed one drachm. (4) In no case did the ligature cut through the spleen, a little of the pulp only being expressed as the loops were tightened. In the large majority of Jordan's cases coarse silk was used for the continuous ligature, but in two or three cases stout carbolized catgut was employed. (5) The very low mortality.

In cases of rupture of the spleen which are seen in time for surgical interference, this continuous ligature may be employed to arrest the hemorrhage, but the procedure to be adopted would depend upon the extent and position of the rupture. If the injury be of small extent, surrounding the bleeding surfaces with the continuous ligature may be the best treatment; if of larger extent, it would probably save time and be better to excise the damaged portion in the way described. This ligature will also be found to be of service in hepatectomy and in small ruptures of the liver.

In the experimental investigations carried out, nineteen dogs had the lower half of the spleen excised without a death; three dogs had the upper half removed with one death. None of the dogs in which the lower half was excised appeared to suffer the slightest inconvenience or shock after the operation; they at once ran about unfettered and ate voraciously anything they were given. The three dogs which had the upper half excised suffered greatly and one died from shock. It is the removal of the upper half of the spleen which is in the author's opinion so full of danger, so prolific of shock, and often hemorrhage from some small vessel which has either been overlooked or else has retracted before the ligatures were tied. The removal

of the upper half is more difficult than that of the lower half; many more vessels need ligaturing, including, in some cases, a branch from the phrenic previously mentioned, and which may easily be overlooked with fatal results. This artery was present in two of the three excisions of the upper half and in three of the six total excisions. In man it is also occasionally present. Again, in removal of the upper half greater tension has to be applied to the pedicle, which is a distinct cause of shock. Whether the whole spleen or only its upper half be excised does not affect the present argument. In the six cases of total extirpation before referred to, all the dogs suffered greatly from shock, and there were three deaths, the one already mentioned from marasmus and two from shock. If to these six be added the three in which the upper half was excised with one death, we have nine cases and three deaths from shock, a mortality of 33.3 per cent., the survivors also suffering greatly as compared with the nineteen cases of excision of the lower half with no shock or death. May not this great difference be explained by a consideration of the nerve-supply of the spleen and of the relative damage done to the sympathetic nervous system in each case? for on these sympathetic nerves depend the normal tone of all the abdominal vessels and viscera containing any muscular tissue, and all changes in the caliber of these vessels — paralysis or inhibition of their vaso-constrictor fibers causing an extreme fall of blood-pressure, the animal practically bleeding to death into his abdominal vessels—and sudden death has resulted from a slight blow in the epigastric region or from a draught of iced water interfering with the functions of these nerves. It may be well to consider the blood-supply of the spleen first, as the arteries are surrounded or accompanied by the nerves.

The splenic artery, by its pancreatic branches, supplies the body and tail of the pancreas; the left gastro-epiploic running along the greater curvature supplies both surfaces of the stomach and sends branches to the omentum on the left side, some of which may run on to supply the spleen; other branches to the stomach, the vasa brevia, four to eight in number, are given off towards the termination of the splenic artery, some of these arising directly from the trunk and some from the upper two or three of the terminal or splenic branches. The artery then divides some little distance from the spleen into a varying number, from five to ten, terminal or splenic branches, which enter at the hilus and ramify in the body of the spleen; some of the upper of these give off short gastric branches. In addition to the above there is often the branch from the phrenic running to and supplying the spleen.

The nerves which accompany these arteries are derived from the solar plexus. This, the largest sympathetic plexus in the body, is built up by the semilunar ganglia, nerves from the lumbar portion of the gangliated cord of the sympathetic, the great splanchnics, and the vagi. Through its secondary plexus it supplies the diaphragm (in part) and all the viscera and blood-vessels of the abdomen. Of these secondary plexuses the celiac chiefly concerns the present argument. This plexus is of large size, derived from the forepart of the solar plexus, is joined by the two small splanchnics, and on the left side is augmented by large direct branches from the right vagus. It then furnishes the coronary, hepatic, and splenic plexuses; the latter, surrounding the splenic artery, is again joined by direct branches from the left semilunar ganglion and the right vagus. It supplies the pancreas and stomach through its pancreatic and left gastro-epiploic plexuses, some of the latter running on to the spleen; it again supplies the stomach by branches accompanying the arterial vasa brevia, and then running with the terminal branches of the artery ends in the spleen. In addition to these nerves there are branches from the diaphragmatic plexus accompanying the branch from the phrenic artery when this is present. During an operation it is impossible, of course, to separate these nerves from the arteries, so that a ligature necessarily includes both. A comparison of the operations may be thus stated:

(*a*) Removal of the whole spleen necessitates the ligaturing of: (1) The splenic branches or, what is the same thing in effect, the splenic artery and nerves before they divide into their terminal branches. (2) The vasa brevia arising from the terminal or splenic branches; this must be done even if the trunk of the splenic artery itself be divided, or else, with the free anastomoses that exist on the stomach, there will be hemorrhage backwards along these branches; neglect to ligature these arteries is probably the cause of some of the deaths from hemorrhage after the extirpation of the organ. (3) The branches from the left gastro-epiploic and phrenic when present. If these

have been divided close to the spleen, as many as from fifteen to twenty small vessels and their accompanying nerves may be included in the different ligatures on the pedicle. If the splenic artery itself be divided, this number would be reduced by the five to ten terminal branches, but the effect on the nervous system would be the same, the "trunk" of the nerve being involved in place of its branches.

(*b*) Removal of the upper half necessitates the ligaturing of the same arteries except the lower two or three terminal branches, as many as from twelve to eighteen vessels and nerves being included in the ligatures on the pedicle.

(*c*) Removal of the lower half can be effected by ligaturing the lower two or three terminal branches only. In the two latter operations there is in addition the continuous ligature across the spleen.

From this it will be seen that excision of either the whole or the upper half of the spleen involves great damage to the splenic plexus with its intimate (threefold) connection with the solar plexus and right vagus; entails direct interference with part of the nerve-supply of the stomach and omentum, and severe indirect interference with the vagi and all the sympathetic nerve-supply of the abdomen; the diaphragmatic plexus is often involved and considerable tension has to be applied to the pedicle, and therefore on the celiac and solar plexus and the vagi, thus augmenting the interference with these nerves. The excision of the lower half entails but slight damage to the splenic plexus, and therefore but slight indirect interference with the solar plexus and vagi; the nerve-supply to the stomach, the omentum, and the diaphragmatic plexus is never involved and but slight tension has to be applied to the pedicle. As shock is due to severe inhibition and exhaustion of nerve function, and the grosser the lesion the greater is the shock that results, this great difference in the amount of interference with the nervous system in these operations is the explanation of the great difference in the amount of shock following them; and in the excision of the whole spleen or of the upper half the resultant shock is due to inhibition and exhaustion of the vaso-constrictor fibers of the abdominal sympathetic, and is probably intensified by great interference with the proper performance of the functions of the heart, lungs, stomach, etc., reflexly by means of the vagi. These considerations would induce the writer to advise in suitable cases in the human being—*e.g.*, abscess, tumor, or cystic disease confined to the lower half, or in hypertrophy which resists medicinal treatment—the excision of the lower half in preference to that of the whole spleen, as the same object would be attained (the removal of the disease or the enlargement), whilst a considerable portion of the spleen would be left to carry on its function; and further, there would be as a reasonable inference a considerable reduction in the death-rate.

TREATMENT OF ACROMIO-CLAVICULAR DISLOCATION.

RHOADS (*Annals of Surgery*, January, 1898) calls attention to the fact that dislocation of the acromio-clavicular articulation is usually described as a dislocation of the acromial end of the clavicle, but following the usual nomenclature of dislocations, it is really a displacement of the acromion process of the scapula, the distal bone being the one usually spoken of as the bone dislocated.

In the great majority of dislocations of this joint, the acromion process is displaced downward and inward beneath the clavicle, the outer end of the latter bone riding on the top of the acromion, and the instances are very few where dislocation of the acromion takes place upward with the clavicle engaged beneath the process. This fact is readily explained when one studies the structure of the joint and the character of the injury usually received. The articular ends of the bones are simply two small plane surfaces that are held in apposition by a capsular ligament which completely surrounds the articular margins, but which is so lax in all positions of the joint that the acromion is not tightly braced to the clavicle. This provision of laxity of the capsular ligament permits of a fair range of motion of the scapula upon the clavicle as the former glides upon the thorax, not only in the forward and backward and upward and downward movements, but also in a rotary direction which is called for in the complex movements of the upper extremity. As the joint is superficially placed, some protection is given to it by the aponeurosis of the trapezius and deltoid muscles, the fibers commingling with those of the upper surface of the ligament, while beneath the clavicle is firmly bound down to the coracoid process by the short conoid and trapezoid ligaments, which have, however, no relation to the joint proper.

In all motions in which the shoulder is engaged, the scapula moves upon the outer end of the clavicle, the latter moving in unison upon the sternum, the function of the acromio-clavicular joint being principally to preserve the obliquely forward direction of the glenoid cavity—that is, if there was no such joint, when the scapula slid forward on the thorax the glenoid cavity and shoulder-joint would point inward, and when the scapula slid backward the shoulder-joint would move outward. The joint, therefore, governs the various movements of the scapula, and keeps the glenoid cavity at all times in a forward position. But in accomplishing this preservation of uniformity of position of the shoulder there is but a small—edge to edge, so to speak—articular function of each bone on which the function solely depends, and when certain forms of injury are brought to bear upon the joint—injuries to which the articulation is always exposed from its superficial relations and its position in the body—a disturbance of these meager joint relations, or dislocation, is easily brought about.

The injury that may produce a luxation of this articular union is a blow of sufficient force on the back of the shoulder, as for example, a heavy weight falling from above and striking the shoulder when the body is bent forward, or the participation in an accident in which the body is hurled forcibly, striking the back of the shoulder against some solid object. If the blow lands on the front of the shoulder, a fractured clavicle usually results, whereas if the blow is struck posteriorly, over the acromion or spine of the scapula, the dislocation under consideration is what generally takes place. A blow over this particular area is, however, somewhat infrequent, which accounts for the fact that in the vast majority of cases the blows which the shoulder sustains generally result in a fracture of the collar-bone. The injury is, however, of sufficient frequency to make it one of the surgical pathological phenomena for which the practitioner must be constantly on the lookout.

The recognition of the luxation is not a matter of serious study, and yet it presents, on first sight, a deformity so akin to that of a dislocation of the humerus forward that an unpractised eye may have some difficulty in determining exactly the precise lesion. The rotundity of the shoulder will be destroyed, and the projection of the overriding clavicle may be mistaken for the apparent projection of the acromion in shoulder-joint dislocation. When, however, it is remembered that the shoulder-joint is depressed but that its motion is not seriously curtailed—*i.e.*, it is not rigid; that the shoulder-joint is carried slightly forward and inward; that the hand of the injured side may easily be carried to the shoulder of the sound side when the elbow is on the chest; that by following the line of the clavicle the normal relations of this bone with the acromion are disturbed, the clavicle being on top; that there is no marked fossa above the head of the humerus; and that the projection of the clavicle is fully one inch within the line of the humerus—one cannot fail to recognize the actual condition.

The treatment of the luxation will necessarily consist in reduction and retaining the limited articular surfaces in position until union of the torn capsular ligament is established. The former is usually easy, the latter most difficult. Reduction can be effected by pushing upward and outward on the arm, which raises the glenoid cavity and scapula, and by manipulation pressing down the overriding end of the clavicle into its normal position and relation with the acromion. This may be done with or without anesthesia, according to the pain-resisting powers of the patient.

The retention of the bones in position now becomes a matter of some difficulty. Desault's dressing is usually recommended, but it proves inadequate for the purpose, the deformity being resumed after the lapse of a few hours, when bandages have stretched and muscles are relaxed. Stimson's adhesive plaster dressing has the disadvantage of causing erosion of the skin in most patients before ligamentous union takes place, which erosion at least is a source of great annoyance, and the test of the efficiency of the method as a curative agent is rendered rather dubious by the information which accompanies the description: "Recurrence can be readily detected through the plaster by the finger or the eye." In fact, some text-books even go so far as to say the retention of the bone in place after reduction presents so many difficulties that it is not worth while to attempt it. To this, however, we would not readily acquiesce. A method of treatment which has answered admirably in the writer's hands seems to meet all the requirements for obtaining a satisfactory result, and the application may be set forth in the following case:

H. H., aged forty-five, of strong muscular development. While the patient was driving in a carriage the horse became unmanageable

and ran away, upsetting the vehicle and hurling its occupant out into the road. He struck the earth forcibly with the upper and back part of his right shoulder, and when found was suffering from a marked deformity of the shoulder, bruises at different parts of the body, severe pain, and shock. A temporary dressing was applied to the shoulder, and the patient was sent to the writer's care on the following day. On examination, there was found considerable swelling, but not sufficient to occlude a marked prominence of the outer end of the clavicle; the acromion could not be felt, and the shoulder was depressed and approximated to the middle line of the body. There was also an apparent lengthening of the right arm.

The patient suffered such intense pain that the author decided to give him an anesthetic to effect the reduction, and to determine at the same time if there was any fracture associated with the luxation. He called to his assistance Dr. J. C. Brick, and while he anesthetized the patient the reduction was effected by the aid and advice of Dr. J. Chalmers Da Costa, no other lesion being found. A pad was placed in the axilla, and a Desault bandage applied. The following day it was found that the deformity had reappeared, and on being reduced by manipulation, the same dressing was reapplied more tightly. This, too, failed to keep the bones in position, and the patient complained of the pain from the tight dressing. Other dressings were then applied according to prescribed methods, and each day the deformity was found to persist. At the end of a week it was suggested that a strap fastened over the shoulder and drawn as tightly as the patient could stand might prove capable of holding the bones in place, and after again reducing the dislocation and holding the bones in position the writer applied such a dressing.

A wedge-shaped pad of absorbent cotton rolled in a towel was placed under the arm, the apex of the pad being pressed firmly into the axilla. A folded towel of heavy texture was placed across the shoulder so as to make it possible to exert pressure over a broad area at the site of injury, and a strap two inches wide (an ordinary trunk-strap was used in this instance) was thrown across the shoulder and under the elbow, and tightened. A pad of absorbent cotton prevented too great pressure on the elbow where the strap crossed. The strap was drawn as tightly over the shoulder as the patient could well bear it, the point where pressure was exerted being internal to the joint—*i.e.*, between the articulation and the root of the neck—so as to control both the scapula and the clavicle, and the trapezius muscle, without causing the pain of pressure directly over the site of injury. A single retaining bandage passed under the opposite axilla prevented the strap from slipping off the shoulder. The placing of the wedge-shaped pad under the arm with the broad base downward made it possible to exert pressure on the line which would do the most good—upward, outward, and backward—raising the glenoid cavity and with it the scapula, while the clavicle was pushed downward by the same force and thus prevented from again riding up over the acromion. A roller bandage around the chest anchored the arm and elbow to the side, the buckle of the strap not being covered in, so that the strap could be tightened, if necessary, without disturbing the rest of the dressing.

The skin was prevented from being irritated by strips of cotton properly placed. As the patient became accustomed to the pressure, and the shoulder-pad felt somewhat loose on the day following the application, the strap was drawn several holes tighter, the bones being found, however, to have remained in good position during the intervening twenty-four hours. This dressing was kept *in situ* for a week, the parts being examined daily to see that the bones had not slipped. At the end of a week a hand was inserted under the shoulder-pad and the bones firmly held, the arm being held in a fixed position by an assistant, while the entire dressing was removed and the skin surface bathed. The dressing was reapplied weekly after this for two weeks longer, at the end of which time it was discarded altogether, and a spica of the shoulder substituted for still another week. All dressings were then removed. Some pain was experienced on the side of the neck after the original dressing was discarded, which was probably due to some injury to the nerves constituting the cervical plexus at the time of the accident. This disappeared on massaging the parts daily for several weeks, and the patient is now in excellent condition, having full use of his arm without any pain or deformity in the shoulder. The good result obtained in this case, and the simplicity of the application, would tend to recommend the method as a suitable one in the treatment of this refractory lesion.

Reviews.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY. A Digest Collated and Arranged with Critical Editorial Comments by a Large Number of Collaborateurs under the General Editorial Control of George M. Gould, M.D. Illustrated.
Philadelphia: W. B. Saunders, 1898.

For all practical purposes this Year-book is the most complete and exhaustive single volume dealing with the advances of Medicine and Surgery which is published in any language. There are, it is true, other year-books, particularly in Germany and France, but none of them are as presentable in appearance nor as exhaustive in scope as is the one before us. Further than this, none of them reflect, so far as we are aware, the personal views of the collaborators who assist the editor, and this expression of personal opinion adds very materially to the interest of the book. As a means of attracting attention to the main topics discussed on each page, the method has been carried out of printing important words in large and heavy-faced type, so that in glancing over the page one's eye immediately lights upon the reference or fact which he seeks. This we believe is a useful method, but it requires very careful editing on the part of those who are reading the pages going through the press, else unimportant words receive undue emphasis. While care may have been exercised in this respect in this volume, in a few instances it is lacking, as for example on page 924, where the subject under discussion and the physiological action of the drug are both in the same size type. Such mistakes are, however, not common. Again, we have found in one or two instances in the index that typographical or other errors have been made, with the result that the topic mentioned is not found upon the page indicated. We also notice that proper names are very frequently abbreviated. As this abbreviation saves practically no space and mars the appearance of the book, it seems to us a mistake to print Jas. for James or Geo. for George. We have mentioned these two minor faults because they are practically the only ones which can be found in the very handsome volume of more than one thousand pages.

A number of changes have taken place in the staff of collaborators, but as a rule those who have taken the place of older friends are equally well known as authorities by the medical profession. We are glad to notice that the pages of the THERAPEUTIC GAZETTE have contained so much valuable material that it, with the *British Medical Journal*, *The Lancet* and other prominent journals in this country and abroad are frequently quoted.

The book can be cordially recommended to any one who wishes a summary of medicine in all its branches for the past year or eighteen months, and we once more extend our congratulations to the editor, Dr. Gould, on the appearance of another evidence of his extraordinary literary activity.

SEXUAL NEURASTHENIA: ITS HYGIENE, CAUSES, SYMPTOMS, AND TREATMENT. By George M. Beard, M.D. Edited with Notes and Additions by A. D. Rockwell, A.M., M.D.
New York: E. B. Treat & Company, 1898.

This, the fifth edition of a very well known book, comes to us after a shorter interval than has been the case with previous editions. Many of the profession are already familiar with it. It deals with the nature and varieties of neurasthenia, then with the evolution and relation of the sexual sense, the relation of neurasthenia to other diseases, sexual hygiene, diagnosis and prognosis, the treatment of sexual neurasthenia, and diet for the nervous, and finally, a chapter upon sexual erythism. It is true, as pointed out by the editor, Dr. Rockwell, there are a large number of cases of sexual neurasthenia with or without complications continually presenting themselves to the physician for treatment. It is also true, as he points out, that no one has succeeded better than Dr. Beard in delineating the symptoms or describing the diagnosis and treatment for this class of patients. The book is printed in good large type and is as worthy as ever of professional confidence.

DISEASES AND INJURIES OF THE CONJUNCTIVA, ESPECIALLY THE SO-CALLED GRANULATED LIDS. By John H. Thompson, M.D., Kansas City. First Edition, 1897.

The author prefaces this little book of 200 pages with the statement that "Its purpose is to assist practitioners and students of medicine to recognize and treat the diseases and injuries of the conjunctiva. It is not intended that it shall take the place of any of the excellent text-books. . . . for it is simply a collection of short essays." The intention of the author is a good one. All books well and simply written on special subjects are interesting to students and practitioners, but we regret to say that his intention has not been, in all cases, accomplished. The style he has adopted is so easy and familiar and almost colloquial that the meaning is not always clear. The contents are

too specific for the student and general practitioner, and not sufficiently concise and elaborate for the specialist. A more practical and comprehensive discussion of diseases of the conjunctiva will be found in any of the standard text-books. The phraseology is in discord with the rules of the construction of sentences of any known language. Thus, on page 43: "The patients complain of the light, and some of them of an intolerable itching of the lids, it being almost impossible to avoid scratching them." One of the most commendable chapters is that on injury to the conjunctiva, in which minute directions are given for the management of the trifling, yet painful, traumatisms that most authors deem too insignificant to more than mention. The proof-reading has been careless, and here and there serious typographical errors have crept in. For example, page 34, he says: "A solution of 5 grains to the ounce of distilled water may be applied to the inverted lids." The illustrations are so imperfectly executed that they do not elucidate the text. The book is neatly bound, but in other respects the publisher's work might have been more creditable. H. F. H.

TWENTIETH CENTURY PRACTICE. An International Encyclopedia of Modern Medical Science. By Leading Authorities of Europe and America. Edited by Thomas L. Stedman, M.D., New York City. In Twenty Volumes. Volume XIII: Infectious Diseases.
New York: William Wood & Company, 1898.

This thirteenth volume of the Twentieth Century of Practice, somewhat smaller than some of its predecessors, is devoted almost entirely to subjects which are not of particular interest to the general practitioner, and contains articles upon Ptomaines, Toxines, and Leucomaines, others upon Infection and Immunity, Water-borne Diseases, the Duration of Incubation and Infectiousness of Acute Specific Diseases, Smallpox, Vaccinia, and Mumps.

As will be seen, some of these chapters are not very closely related.

The article by Dr. Vaughan, on Ptomaines and Toxines, which we have mentioned, is very exhaustive and occupies the first 131 pages of the book. The article upon Infection and Immunity, by Dr. Harold C. Ernst, of Boston, extends from page 131 to 279, while that upon Water-borne Diseases, by Mr. Ernest Hart and Solomon C. Smith, is about 80 pages in length. Dr. Dawson Williams writes upon the Duration of the Incubation and Infectiousness of Acute Specific Diseases, a comparatively brief article, and Dr. Moore, of Dublin, contributes that upon Smallpox; Brouardel, of Paris, writes upon Vaccinia, and Comby, of the same city, upon Mumps.

We have the same complaint to make about the index of this volume as we had about previous volumes. It is not as complete and thorough as the character of the work deserves.

The fact that this volume is not as interesting to the practitioner as have been some of its predecessors does not militate against the value of the System in general, which is, as it is intended to be, a monumental piece of work, representing the state of Medicine in the latter part of the nineteenth century.

THE YEAR-BOOK OF TREATMENT FOR 1898. A Critical Review for Practitioners and Students of Medicine and Surgery.
Philadelphia and New York: Lea Brothers & Co., 1898.

This well known book is compiled by a large number of English physicians and contains much of the useful information which has been accumulated in regard to the action of drugs during the latter part of the year 1896 and most of 1897. It covers the treatment of all affections, both surgical and otherwise, and is completed and indexed by authors and by subjects, which increases its value.

The work has been well done by those who have collected the information which it contains. In a number of instances their comments upon the quotations which they make are of interest and value.

The price of the book is one which places it within the reach of every practitioner, and to those who are unfortunate enough not to be subscribers to the THERAPEUTIC GAZETTE this book will convey to them information which, otherwise, they have missed in current literature.

THE THERAPEUTICS OF INFANCY AND CHILDHOOD. By A. Jacobi, M.D. Second Edition.
Philadelphia: The J. B. Lippincott Company, 1898.

Dr. Jacobi has been for so many years one of the leading physicians in the specialty of diseases of children, and one of the leading physicians from every point of view in the profession in the United States, that any contribution from him is certain to obtain the attention which it deserves. That this opinion is based upon fact is shown by the rapid exhaustion of the first edition of his book, which appeared but a little more than two years ago.

To the practitioner of medicine the book possesses an added charm because of the fact

that the personal experience of the writer is reflected on almost every page. Like other books which have authors of Teutonic origin, the text is written in an informal style which makes one feel that he is reading the report of a clinic rather than an essay upon pediatrics. For this reason the book is not satisfactory as a text-book for students. Although it covers less than 650 pages, it deals with diseases of the skin, of the bones and joints, and of the eye and ear in childhood; and this illustrates the fact that no part of the volume can be considered an exhaustive or complete treatise upon the diseases which it considers. As representative of the opinions and practises of a physician of high repute, the book can be cordially recommended as one which will bring its reader closely in touch with his cases.

THE ELEMENTS OF CLINICAL DIAGNOSIS. By Professor Dr. G. Klemperer. First American from the Seventh German Edition. Profusely Illustrated. Authorized Translation by N. E. Brill, A.M., M.D., and Samuel N. Brichner, A.M., M.D.
New York: Macmillan Company, 1898.

The name of Klemperer is so well known to physicians in Europe and America that anything written by him must attract attention and be worthy of examination. The volume before us is a small octavo of less than 300 pages, in which the elements of Clinical Diagnosis are carefully outlined. The first part of the book is devoted to methods of diagnostic examination, and then we find carefully drawn up but precise directions as to the acute febrile and the acute infectious diseases. Diseases of the nervous system, of the digestive system and of the upper air-passages are then discussed from a diagnostic standpoint. Chapter VI deals with the diagnosis of diseases of the respiratory tract, and Chapter VII with those of the circulatory system. Chapters VIII and IX deal with examination of the urine and diseases of the kidney, Chapter X with disorders of the metabolism, Chapter XI with the diagnosis of diseases of the blood. The twelfth chapter considers animal and vegetable parasites, while Chapter XIII discusses the Roentgen rays as diagnostic aids. Considering the size of the book, this is one of the best diagnostic manuals with which we are acquainted, and should prove as popular among English speaking medical men as it has with our Teutonic brethren; for though we have looked over it with considerable care, we have not found anything that varied from the line of usefulness or accuracy.

HUGH WYNNE, FREE QUAKER. Some Time Brevet-Colonel on the Staff of His Excellency General Washington. By S. Weir Mitchell, M.D., LL.D.
New York: The Century Co., 1898.

There are few books belonging to fiction which have become more popular during the last year than this novel by Dr. S. Weir Mitchell. This popularity depends first upon the fact that Dr. Mitchell has brought to his authorship the results of careful historical study and has made himself thoroughly in touch with the spirit of the times of which he writes. It is also interesting because one feels in reading it that he is at least to some extent improving his knowledge of the conditions of the United States during, immediately after and just prior to the Revolutionary War. And finally, and most effective of all in the volume has been Dr. Mitchell's ability to make all his characters human and to touch the heart of the reader from time to time with spirited ideas concerning love and war.

This edition of Hugh Wynne is published by the Century Company in two small octavo volumes, well printed upon good paper, and should prove most popular with those members of the medical profession who have not as yet read the book.

Not infrequently medical men wander far afield from the paths of professional literature into those of fiction and poetry, but very few are markedly successful in these wanderings. In this respect, however, Dr. Mitchell is *facile princeps*, and it is a pleasure to find that a member of our guild can at one and the same time be a distinguished physician, an original investigator, and a most successful author of fiction.

ENCYKLOPÆDIA DER THERAPIE. Herausgegeben von Oscar Liebreich unter Mitwurkung von Martin Mendelsohn und Arthur Würzburg. Zweiter Band. II Abthelung.
Berlin. August Hirschwald, 1898.

We have already mentioned in various numbers of the THERAPEUTIC GAZETTE during the last three years the earlier parts of this valuable and exhaustive German Encyclopedia. The present volume of 200 pages extends from Glykokoll to Hydronephrose. We note among the contributors of articles to it such well known names as Munk, Mendelsohn, Wolff, Schleich, and Stadelmann.

The object of the Encyclopedia is, as we have stated, to deal not only with things that are directly therapeutic, but with collateral branches in medicine, and much valuable information in regard to common and unusual drugs is contained in the volume.

RUBÁIYÁT OF DOC SIFERS. By James Whitcomb Riley. Illustrated by C. M. Relyea.
New York: The Century Company, 1897.

This is a small octavo volume of a little over 100 pages, with an illustration to almost every page, which illustrations serve to greatly increase the interest in the text since they are all cleverly executed and represent the ideas given us in the verses placed beside them. The characteristic *patois* in which the verses are written makes the reading, perhaps, a little more difficult than they would be if written in ordinary English, but there is from beginning to end that rhythm or jingle which has made Mr. Riley's poetry so popular in this country. The opening verses in the way of a preface differ in meter and in style from the main poem. This is the first of the preface:

We found him in the far away
That yet to us seems near,
We vagrants of but yesterday,
When idlest mirth was here,
When lightest song and laziest mirth
Possessed us through and through,
And all the dreamy summer earth
Seemed drugged with morning dew.

THE RETROSPECT OF MEDICINE. A Half-yearly Journal Edited by James Braithwaite, M.D., and Alfred Trevellyan, M.D. Volume XVI, July to December, 1897.
London: Simpkin, Marshall, Hamilton, Kent & Company, 1898.

As is well known to our readers, Braithwaite's Retrospect of Medicine has now been before the profession for the long period of fifty-eight years and is to-day as valuable as ever, for it contains in condensed form the best articles which have appeared during the six months from June to December, 1897. All these articles are picked out because of their particular reference to facts of interest to the general practitioner. The present volume is, we think, even better than its predecessors in the practical character of its contents. The book is published in this country from advance sheets sent to G. P. Putnam & Sons, of New York, and still merits the confidence which has heretofore been reposed in it.

ELEMENTS OF LATIN. For Students of Medicine and Pharmacy. By George D. Crothers, A.M., M.D., and Hiram H. Bice, A.M. $1.25 net.
Philadelphia: The F. A. Davis Co., Publishers, 1898.

We are told in the preface of this little manual of 242 small octavo pages that it is designed to present within the briefest possible compass those principles of Latin etymology and construction which are essential to the intelligent application of the terminology of pharmacy and medicine. Some one has said "half the difficulty of anatomy is inherent, the other half is in wordiness." "The trouble with the student is more in the names of things than in the things themselves. He mistakes the one for the other; his head swims, and then he founders in the sea because of his Latin storm." It is with the object of smoothing the billows which threaten the voyage of the medical student, at least in the early days, that this little book has been compiled. It seems to us to fulfil its function admirably, and we trust that it will do much towards increasing the knowledge of medical Latin.

THE CARE AND FEEDING OF CHILDREN. A Catechism for the Use of Mothers and Children's Nurses. By L. Emmett Holt, M.D.
New York: D. Appleton, 1897.

As its title indicates, this tiny book of just one hundred pages is a catechism covering the diet of children. It is arranged, as have been some recently published quiz books, in the form of questions and answers, in a manner which reminds one forcibly of the celebrated "Ben Franklin Primer." It contains much valuable information for the persons for whom it is intended, but we do not see that the question and answer form of the text has materially increased its value.

Correspondence.

LONDON LETTER.

BY RAYMOND CRAWFURD, A.M., M.D. OXON., M.R.C.P. LOND.

During the past week the influenza epidemic has undergone a slight remission in London, and with the return of colder weather it is to be hoped that the improvement may be further sustained. The character has for the most part been of the gastro-intestinal type, with sudden and profuse watery diarrhea, and vomiting. In one or two instances the symptoms have been so severe as to produce a most alarming condition. Such an epidemic has worked havoc in the Warwick County Lunatic Asylum. At first it was thought that the symptoms were due to some poison in the food supplied to the inmates, and this seemed to be confirmed by the fact that the largest daily incidence occurred the day after a ball had been given in the asylum. It was even suggested that some of the patients who were well enough to be employed in the kitchen had put arsenic in the food. However, it was shown beyond all doubt that they had to deal with

a very virulent form of influenza. There was an intensely acute onset with rigors and generalized pains in the limbs, head, and neck; coryza and pain in the eyeballs were mostly present. This was followed by vomiting and diarrhea. The evacuations in some cases tended to be choleraic in character, and slight jaundice was not uncommon. The temperature was usually very high at the commencement of the diarrhea, but fell rapidly, usually below normal. The crisis of the temperature was usually marked by profuse and exhausting perspiration, leaving the patient in a state of extreme collapse. In cases of this kind an intense urticaria not infrequently accompanies the crisis. The infectious character of the epidemic was demonstrated in several cases by direct communication to others outside the asylum, who had not partaken either of food or drink within its walls. Intestinal antisepsis has not been of much service in these cases.

At a meeting of the Hunterian Society, Dr. Hingston Fox read a paper on the Treatment of Constipation. He recognized two main forms of constipation—the one due to peristaltic disorder, the other due to lodgment of feces in or above the rectum. The latter seems in most cases to arise from neglect of the calls for relief, so that the rectum becomes less sensitive and also less automatic in its action; hence the importance of careful discipline in the habit in early childhood. It is quite useless to treat these cases by constant laxatives, although those that act on the lower bowel may be useful for a while. To regain the lost habit of rhythmical defecation Dr. Fox suggested certain practical rules: (1) Absolute regularity in soliciting the bowels twice daily—that is, after breakfast and in the evening, when fatigue relaxes the sphincter. An evening evacuation is certainly a habit to be cultivated by business men, whose early hours make regular and leisurely defecation an impossibility in the morning. (2) Easy posture. Lauder Brunton suggests the use of a footstool, but in this matter of posture each man must needs be a law to himself. (3) Distraction of the attention. (4) In cases of difficulty, postponement of vesical relief until after breakfast, so as to get simultaneous relaxation of both sphincters. (5) Removal of all local sources of irritation. (6) Occasional small enemata. We cannot but dissent from this last measure in those cases in which the rectum is unduly insensitive. Glycerin enemata and glycerin suppositories very rapidly remove the last remnant of automatic activity, and in our experience water enemata are only a degree less harmful.

Dr. Dawson read a paper on the Physical Signs of Stomach Disease and Their Relations to Diagnosis and Treatment. Dilatation of the stomach he considers to be almost always present in chronic dyspepsia, and for this reason he advocates drugs that increase the motor power of the stomach, such as nux vomica. For anemic dyspepsia he recommends iron and arsenic from the first, with bismuth. For these cases we ourselves have been in the habit of combining the tartrate of iron with liquor bismuthi et ammonii citratis, and with most satisfactory results. When pain is prominent, the addition of a few grains of bromide of ammonium to each dose usually does all that is needful. In cases of chronic dyspepsia with marked dilatation, in which retention of food in the stomach with marked fermentation is the prominent feature, he uses lavage with electricity and massage, and of drugs, arsenic and alkalies.

At the Society of Anesthetists Mr. Alexander Wilson, of Manchester, opened a discussion on the methods of treatment in emergencies under anesthetics. He grouped the remedial measures under six heads: (1) External applications, such as cold, Corrigan's button to the epigastrium, ammonia vapor to the nostrils, which excites respiration merely in a reflex manner. (2) Reflex excitation and respiration by mechanical means—for example, rhythmic traction on the tongue and dilatation of the sphincter ani. (3) Stimulation of the heart by mechanical and electrical means, including actual puncture. (4) Artificial respiration. (5) Measures counteracting circulatory failure, such as posture and transfusion. (6) Drugs, including amyl nitrite, strychnine, atropine, etc.

With regard to the first two classes it is of course necessary that the nervous tissues should have sufficient vitality to convey stimuli. Mr. Wilson considers artificial respiration the most effectual measure for stimulating a failing circulation. It acts in three ways—by removing the anesthetic vapor, by supplying fresh air, and by promoting blood circulation. Inflation and Sylvester's method of artificial respiration are the most efficient, but faradization of the phrenics may be useful in old subjects with rigid chests. Subcutaneous injection of drugs is open to the

objection that for their absorption some degree of circulatory activity is necessary. Schäfer contended that the respiratory, vasomotor and other centers in the medulla were all affected simultaneously by anesthetics. At a certain stage in the action of chloroform blood-pressure rapidly falls; this goes on *pari passu* with paralysis of the respiratory centers, while the action of the heart itself grows weak, probably in consequence of paralysis of the vasomotor center. The effect on the vasomotor center is the most fatal in cases of chloroform poisoning on account of the absence of efficient and ready means of counteracting it. The failure of respiration is comparatively unimportant, for so long as the circulation is well maintained, the very slightest exchange of air is all that is necessary. Schäfer advocates the employment of atropine before giving chloroform as a means of preventing arterial dilatation, which is the cause of the dangerous fall of blood-pressure. He also speaks encouragingly of nicotine and suprarenal extract for the same purpose; the former may be given by intravascular injection or beneath the skin. Suprarenal extract has a very powerful effect on the heart, increasing the rate and force of its beat; and these two substances together should go a long way towards enabling patients to recover from vasomotor and partial cardiac paralysis. Gottlieb has long maintained that the effect of suprarenal extract was mainly upon the motor ganglia of the heart. He confirmed his belief by observations of the blood-pressure in animals in which paralysis of the vasomotor centers had been produced by chloralization. By simultaneous observation of the renal arteries, he ascertained that the rise of blood-pressure did not correspond to any diminution of caliber of the arteries, so that the main effect must be on the heart. Cardiac vigor is revived even when the chloralization is pushed to a degree at which the movements of the heart are imperceptible and no longer registerable by the manometer.

Dr. Purdon, of Belfast, advocates the employment of lactophosphate of lime in acne and furunculosis. He prescribes it either in combination with iron or with cod-liver oil. For the latter he gives the following formula:

Gum arabic, ʒ x;
Water, f ʒ j;
Syrup of lactophosphate of lime, f ʒ iij;
Cod-liver oil, f ʒ iv.
Essential oil of bitter almonds, ♏ iij.

Rub the gum, water and syrup together until a smooth mucilage is made; then add the cod-liver oil gradually, with constant stirring, and lastly the essential oil of bitter almonds. Thus made each tablespoonful of the cod-liver oil and syrup of the lactophosphate of lime contains four grains of lactophosphate of lime and fifty per cent. of cod-liver oil.

Dr. Wathen, of Clifton, communicated to the Dermatological Society some unusual local effects from the use of iodoform. He and others had encountered attacks of bullous dermatitis of the hands from handling dry iodoform gauze. In treatment of the condition he had found great relief from the firm application of bandages to the fingers, with boracic ointment and occasionally thick gruel, followed by a visit to Harrogate with the use of Aix douche baths. The line of treatment seems somewhat ponderous for a disorder that presumably should have subsided with removal of the cause.

Sir William Broadbent's pronouncement of the fashionable Nauheim treatment will meet with general approval. He considers that its maximum benefit is derived in cases of dilatation of the heart due to such depressing influences as influenza. It often also gives satisfactory results in cases of functional and neurotic heart disease. In valvular disease it is of course useless when compensation is well maintained, and no symptoms are present; when compensation has completely broken down it is not advisable, as rest in bed and suitable treatment of other kind will be more efficacious. In cases of mitral disease, and more especially mitral stenosis, where a bare balance of compensation is maintained and the stenosis is so far advanced that harm would arise from increasing the contractile power of the right ventricle, it may also be of great service. In aortic disease it is not advisable, owing to the risk of syncopal attacks, though when compensation is breaking down and mitral symptoms are present, it may sometimes yield good results; and the same is true of heart failure from adherent pericardium. As we have pointed out elsewhere, it has always seemed to us that much of the disappointment of the Nauheim system has been due to the modes and methods of its employment. It has been religiously retained in the hands of a few professional promoters as a proprietary remedy to be employed only at their instance, and has thus found disfavor in the eyes of medical men at large. With regard to the artificial substitutes recommended in this country, Sir William Broadbent lays it down

that "this treatment may not yield such good results in England as at Nauheim, as apart from the effects of the natural mineral baths there, and the exercises, the change of air and scene, the quiet uneventful life, the early hours and regular meals, together with freedom from all excitement and worry, will greatly contribute to the success of the other remedies."

Mr. Wallis has some interesting remarks on the causes and treatment of anal pruritus in the *St. Bartholomew's Hospital Journal.* The causes are both constitutional and local, and a small local, given the constitutional predisposition, may lead to a severe pruritus. Errors of diet, especially beer drinking, are the root of many cases, and another frequent cause is uncleanliness. In the well-to-do classes some wines will be found to have the effect of setting up this local irritation, and other articles of diet, such as tea and coffee. Strumous people with delicate skins and a good deal of hair about the anus are apt to suffer, and sometimes the disorder will be found to be a purely nervous phenomenon. Among local causes those within the bowel include constipation, hemorrhoids, polypi, fissures, fistulæ, threadworms, and simple ulcers. In his out-patient department Mr. Wallis found in more than twenty-five per cent. of the cases a small ulcer on the dorsal aspect of the bowel between the two sphincters, or a little higher. Of causes outside the bowel we have to reckon with eczema, pediculi, and excess of sweat that is not washed away from the part. In treatment the first essential is general and local cleanliness; this with attention to diet and relief of the bowels will often suffice. Bran-baths are beneficial, and Mr. Wallis gives the following directions for their preparation: A large double handful of bran is put in a gauze bag and placed in the bath ten minutes before use. A small amount of pearl ash may be added to the water, which should be as warm as the patient can comfortably bear. The bath should last for twenty minutes, the buttocks being separated as far as possible. After careful drying, the parts should be carefully dusted with a powder containing equal parts of zinc, starch, and boracic acid powder. The buttocks should be well separated by a firm pad of cotton-wool, which should be kept applied closely by means of a T-bandage and should be worn at night-time. It will be well if the overnight bath can be repeated in the morning, and after it a strip of lint, spread with boric ointment, can be worn during the day and kept in place by a pad and bandage. If a simple ulcer is present, Mr. Wallis recommends stretching the sphincters under an anesthetic, and scraping the ulcer if necessary. Other causes must be dealt with according to the usual methods.

PARIS LETTER.

By A. R. Turner, M.D. (Paris).

Since our last letter the "affaire Laporte" has at last been brought to an end by the acquittal on appeal of the accused. Thanks to the efforts of Professor Pinard, and also to the pressure of public opinion, the former judgment was quashed and Laporte's conduct was vindicated. Even the counsel for the prosecution was inclined to admit that a physician could not be prosecuted for lack of success in an operation. Dr. Laporte has received about 15,000 francs, as well as the secretaryship of one of the medical societies. Such a result indicates clearly the state of public opinion in the medical world.

Dr. Lermoyez has published an article in which he speaks at length of acute sinusitis of the face and of the necessity of making a rapid diagnosis. This affection in its chronic form is not readily cured even by specialists, but in its first stages a moderately energetic treatment will suffice to prevent a change leading to a chronic condition. Dr. Lermoyez shows by various statistics established by Gradenigo of Turin and Weichselbaum of Vienna that on an average out of five hospital patients one is afflicted with sinusitis. This frequency is due to two principal causes: dental caries or rhinitis, in which case infection takes place either by projection of the pus into the cavity or by propagation. As for dental caries, it is the first large molar which is most readily attacked; it is, moreover, in contact with the maxillary sinus. Another thing to be remembered is that meningitis may result from neglect to cure a relatively simple affection.

Dr. Lermoyez goes on to say that if acute sinusitis is generally caused by catching cold, chronic sinusitis is caused by the physician's neglect. This is due to the fact that most physicians do not recognize this affection in its primary stages. They wait until certain symptoms, such as heat, pain, redness of the cheek, indicate exteriorization of the affection. A thing to be remembered is that in reality two important symptoms allow one to make a rapid diagnosis: the first is the flow

of pus from one nostril—pus which is fetid, as the patient is able to perceive; the second symptom is facial neuralgia—supra- or infra-orbital, dental or epicranial. These two symptoms when occurring suddenly are generally sufficient. Lastly, nothing is easier than to cure a case of acute sinusitis. The principal object is to favor the evacuation of pus, and this is best done by preventing the closure of the natural orifice. Cocaine might be used, but is applied with difficulty by the ordinary practitioner; menthol can be employed much better. Dr. Lermoyez recommends inhalations of a teaspoonful of the following solution: Alcohol (90-per-cent.) 100 grammes, menthol 4 grammes, in a bowl of hot water; this to be repeated every two or three hours. Wet compresses may also be applied on the cheeks or forehead according to the sinus. Another point to be observed is that the first upper large molar should be removed as soon as possible.

At a meeting of the Medical Society of the Hospitals, Mr. Lucien Roques showed a patient who had suffered for three years from intermittent attacks of hemoglobinuria brought on by cold. Applications of ether or ice were sufficient to produce on the spot itself edema resembling urticaria. This spot was localized to the region on which the ether or ice had been placed, and by its coloration seemed to indicate that there had been transudation or a modification of the serum with hemoglobin in solution. The patient showed no signs of hysteria or dermographism. Such a case was to be compared to similar ones indicated by Courtois-Suffit, Mackenzie, and Joseph.

At the same meeting Drs. Achard and Weil called attention to the fact that a virtual condition of glycosuria may exist where no loss of sugar is to be detected, but in which by the ingestion of sugar the reaction of sugar may be found. Such a condition should be compared to what is seen in Bright's disease where albuminuria may not exist. There would seem to exist a certain class of patients presenting the general aspect of diabetic patients, such as adiposity, arterial indurations, varicose dilatation of the face, hemorrhoids, pulmonary emphysema, frequent epistaxis, hemicrania, and baldness, who when treated by the ingestion of glucose show sugar in their urine.

The discussion at the Academy of Medicine on the use of blisters has continued for several weeks. Dr. Huchard, well known for his works on heart disease, says that cystitis and nephritis are caused sometimes by blisters, but that these affections are only important or dangerous in old people with chronic nephritis or arteriosclerosis, and blisters should therefore never be used in such cases. Grandmaison has, moreover, shown how disastrous are the results of the use of blisters in tuberculosis. However, Dr. Hervieux has praised the effects of blisters in puerperal peritonitis, where leeches or wet cupping are really as useful, though they cannot be said to cure the effusion.

The great disadvantage of blisters is that they permit the infection of the skin, the natural covering of which is removed. Pneumonia and pleurisy have been treated in some cases by blisters, and the only result has either been a relapse or an increase in the effusion. As the blister produces only a revulsive action, it is as well to use other means, such as cupping or cold. The modification produced in phagocytosis is not peculiar to the use of blisters, but is apparent when cold baths are employed.

In answer to this, Dr. Panas, the celebrated ophthalmologist, said that blisters and other means of revulsion had not as yet quite disappeared from surgery. For instance, in various forms of arthritis, in the treatment of the inflammation of various viscera, the injection of tincture of iodine or of essence of turpentine was often used; small blisters also were often used in ophthalmology. The author cited a case where a temporal abscess produced a complete recovery of syphilitic iritis treated without result by the specific treatment.

Dr. Cornil, the well known pathologist, described the various lesions brought about by the use of cantharidin, the active principle of blisters. There is a twofold action—one on the blood-vessels, which are distended and allow of the exit of leucocytes, and secondly, a granular condition of the cells in the tubes, followed by their desquamation. These various effects indicate well what can be expected when cantharides are used in old people with weak kidneys.

Dr. Robin again called attention to what he had said about the results of blisters on the absorption of oxygen, to which Dr. Huchard objected that the experiments of Röhrig show that the absorption can be increased by other means. But the experiments of Röhrig are defective, and the absorption of oxygen tends to destroy toxins by burning them.

Dr. Jaboulay, of Lyons, cites a certain

number of cases of exophthalmic goitre which he has treated by section of the sympathetic ganglion of the neck. He proposes in some future case to try only stretching, as he believes that the degeneracy produced by section may go too far.

BERLIN LETTER.

By James J. Walsh, M.D., Ph.D.

It was here in Berlin that Senator first called attention to the benefits to be derived from the salicylates in the treatment of rheumatism. The present position of the prominent clinicians here with regard to the salicylates is interesting. Professor Leyden says very simply of the coal-tar derivatives with antipyretic action that all of them have a favorable influence on the disease — *i. e.*, they are analgesic and quieting, and they reduce the fever. As to which one shall be used depends on the idiosyncrasy of the patient. Some patients react promptly to antipyrin, some to phenacetine or acetanilid, while some are relieved more promptly and effectually by the salicylates.

The order given is about that in which the drugs are employed in his clinic, antipyrin being always administered first. Where none of the coal-tar derivatives do good, and such cases occur, recourse is had to what Leyden calls indifferent remedies. Among these he classes the alkalies. This is quite a comedown for the lauded specific remedy of other days, when every hour of illness was considered dangerous until the urine had been rendered alkaline, and heart complications were supposed to be severe just in proportion to the delay of the alkalies.

Professor Gerhardt says of the salicylates that they undoubtedly often give prompt and efficient relief in rheumatism, but salicylic acid is too hard on the stomach, salicylate of sodium too irritating and depressing to the heart. Antipyrin fulfils the symptomatic indications as to pain and fever quite as well as the salicyl compounds, and has not as many or as serious disadvantages. Except where there are cardiac contraindications, the routine practise in Professor Gerhardt's clinic is to give fifty to sixty grains of antipyrin the first day of an acute attack, and seventy-five grains the next. Usually on the evening of the second day the patient is resting quietly without pain or fever.

In Professor Senator's clinic the salicylates, usually the sodium salt, are administered first. Professor Senator does not claim that it is a specific, though in many cases it has almost a specific action, and he admits that there are certain cases in which other of the coal-tar derivatives give relief when the salicylates have failed.

At most this is claimed to be only symptomatic treatment. The disease itself is left to Nature to take care of. The etiology of the disease all the clinicians admit is a bacterium. Its nature they are not so agreed about. Leyden thinks it is a diplococcus; Senator that it is a degenerate form of staphylococcus; Gerhardt has no special favorite among the forms, but seems convinced of its microbic origin. All of them seem to be agreed that not all the cases of seemingly frank acute rheumatism are due to the same bacterial cause, any more than that all the cases of acute pneumonia are due to the same microbe.

Between pneumonia and rheumatism a number of striking analogies are pointed out over here. Their tendency to occur in damp weather side by side, one being as it were the equivalent of the other in persons of different constitutions; their failure to protect but rather to leave the patient liable to second attacks; their tendency to occur in epidemic form in unhygienic hospital wards or in barracks; the tendency of their bacterial cause to invade other parts, especially serous membranes at a distance from the seat of the original affection, for the diplococcus and the bacillus pneumoniæ have both been found in pure cultures in other organs,—all these similarities make doubly interesting the present identity of views as to therapeutics in their regard.

As said before, the treatment of rheumatism, like that of pneumonia, is merely symptomatic. Local measures play a great part in it, and ice-bags and cold compresses are the favorite applications; the aim being not only to still pain and lower temperature, but to influence the growth of the microbes locally, by making the conditions for growth more unfavorable.

The use of the salicylates locally, as they do not disturb the stomach, and are said not to be so depressing to the heart, while they certainly still the local pain very quickly, is a favorite remedy in a good many clinics over here. Wintergreen oil was at one time used for this purpose, but Professor Pribram, in Prague, has noted that though this is ninety per cent. methyl salicylate, some of the remaining constituents are not indifferent, as

he has got much better results with much less depression, by the use of pure methyl salicylate applied over the affected joints. Enough of the drug is rubbed over the joint so that in twenty-four hours the salicylic reaction may be found in the urine.

For chronic rheumatism Professor Gerhardt employs hot sand baths, an arm or leg being covered with sand at a temperature of 120° to 130° F. It would be practically impossible for patients to stand water this hot, as owing to its high specific heat it parts too rapidly with caloric energy to surrounding objects. In sand these high temperatures are very well borne. The results are strikingly good. Only sodium iodide is employed in connection with them.

Towards the end of last year Professor Neisser, of Breslau (the discoverer of the gonococcus), announced that a new silver compound, protargol, had given him the best results that he had ever obtained in the treatment of gonorrhea. It was an excellent antiseptic with the well known specific antagonism of the silver salts to the gonococcus; it was absolutely unirritating and hence could be used in reasonably strong solutions. Ever since the medical journals have been publishing frequent articles on the subject, nearly all in unstinted praise, and a number of young Americans sojourning in Europe rushed into print with series of cases with wonderful results—"Arbeit statistics" they are called here.

The inevitable reaction is just setting in. Professor von Bergmann, at a clinic the other day, denounced all antiseptic treatment of gonorrhea as illusory, and said he had never found anything better than the old reliable sugar of lead. Dr. Behrend, who has medical charge of the prostitutes of Berlin, and whose experience in gonorrhea is very large, reviewed the contributions of the Breslau school to the therapeutics of gonorrhea at the Berlin Medical Society last week, to the great amusement at least of the older members.

In ten years the whole gamut of the silver salts has been run, each claimed to be a panacea for all the ills caused by the gonococcus. There was nitrate of silver, then argentamin, then alumnol, then for a change ichthyol, then argonin, and now finally protargol. Each of them was heralded from the East as a sure specific, and each, except the last, has fallen into innocuous desuetude. Dr. Behrend has not had the results claimed for protargol, and he has found, notwithstanding its assured blandness, certain unpleasant irritative effects. Others at the meeting shared his want of confidence in the new drug; and Finger in Vienna and Lasser here in Berlin both have not had success with it. It is, however, undoubtedly a most unirritating antiseptic and an efficient one. From Paris come some excellent reports of its use in eye cases, and there would seem to be a place for it in the antiseptic treatment of sensitive mucous surfaces in general.

The most promising thing in the treatment of gonorrhea just now would seem to be Quincke's suggestion as to temperature. The gonococcus is extremely sensitive in cultures to even slight variations of temperature. Dogs with a constant temperature of 39° C. cannot be inoculated with gonorrhea, and Finger found that malarial and other patients with a temperature of 40° C. would not take it. Quincke puts a Leiter coil around the penis and brings the temperature up to 40° for twenty-four hours, and has got some very satisfactory results.

In tuberculous joint affections the conservative tendency of German surgeons is very striking. Operative measures are put off until it is perfectly evident that no less radical means are of any avail. Injections of iodoform emulsion ten per-cent. are made, not once or twice, but three, four, and sometimes five, times, in the hope of halting the progress of the disease without recourse to the knife. A popular bit of surgical technique in this matter just now is the taking of a Roentgen photogram of the joint just after the injection of the iodoform. As the salts of iodine, like the salts of the metals, are opaque to the *x*-rays, a very good idea of the distribution of the iodoform is obtained by this means. As the drug is not soluble in the fluids of the joint and inhibits bacterial growth only by its actual presence on the surface of diseased tissues, it is important that it should be thoroughly distributed over the internal capsular surface and the bony cartilages. As ordinarily injected, however, it needs but a small fringe of diseased tissue to so alter the direction of the injected liquid that most of the emulsionized iodoform will be deposited over but a very limited area. The subsequent passive movements and kneading of the joint will only partially overcome the defect of technique. Time is precious in the therapeutics of such cases; the bacillus is ever being buried more and more beneath inflammatory products, out of the way of antiseptics, so that the Roentgen procedure would seem to be a promising one.

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